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Direct Testimony

T-00000A-00-0194

PART 2 OF 2
BAR CODE #0000136633

To review Part 1 please see:

BAR CODE #0000096339

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS.	]]]]]]	**DOCKET NO. T-00000A-00-0194 PHASE II**

TESTIMONY OF

TERESA K. MILLION

ON BEHALF OF

QWEST CORPORATION

MARCH 15, 2001

TESTIMONY INDEX

EXECUTIVE SUMMARY

Purpose of Testimony

The purpose of my testimony is to present Qwest's Arizona recurring and nonrecurring incremental cost data for unbundled network elements and interconnection services. These data are utilized as a basis for the pricing recommendations contained in the testimony of Ms. Barbara Brohl and Mr. Robert Kennedy.

My testimony introduces and describes the Qwest Integrated Cost Model (ICM). The ICM is an integrated cost model that calculates the *recurring* Total Element Long Run Incremental Cost (TELRIC) for the major unbundled network elements (UNEs) and interconnection services. These elements include the unbundled loop, switching and transport, as well as data base services and signaling. Additionally, my testimony describes Qwest's proposal for UNE deaveraging and addresses several important cost methodology issues.

My testimony also introduces and describes Qwest's Enhanced Nonrecurring Cost Model (ENRC). The ENRC calculates the *nonrecurring* TELRIC for all UNEs and interconnection services.

Finally, my testimony presents a number of stand-alone TELRIC studies, including the UNE Remand studies, Channel Regeneration, CLEC to CLEC Connections, other ancillary services, the Customer Transfer Charge and Line Sharing. My testimony also introduces and describes the Qwest Collocation Model. The Collocation Model is an integrated model that calculates the nonrecurring and recurring TELRIC for collocation services.

The ICM cost results, the ENRC results, as well as the results of numerous additional TELRIC studies, as summarized in Exhibit TKM-01, should be used by the Commission to set recurring prices for UNEs and interconnection services.

The TELRIC Principles

My testimony discusses the TELRIC principles and Qwest's compliance with them in the context of the FCC rules. Qwest's cost models and cost studies produce forward-looking, least-cost long run incremental cost results based on replacement of the entire network, given existing wire center locations.

The Qwest Integrated Cost Model (ICM)

The ICM is a cost model developed by Qwest that is designed to estimate the recurring TELRIC for UNEs and interconnection services.

The ICM calculates the costs for UNEs using the same basic methodological approach that was used in previous Qwest (U S WEST) UNE cost studies filed before this Commission. However, the ICM model itself reflects several significant improvements over previous UNE cost models. For example, the ICM provides input forms for each of the modules, which allow the user to change key input assumptions. The input forms display the default value for each input item, and allow the user to override these values if desired. After all desired changes are made to the inputs, the user can easily rerun the ICM to produce UNE cost results based on the new user assumptions.

The ICM contains recommended default inputs. If the model is run with these inputs, it produces results that properly reflect the TELRIC principles described in my testimony. The ICM model, using the default inputs, provides a reasonable estimate of the recurring TELRIC for UNEs in Arizona. The ICM is provided as Exhibit TKM-02.

Nonrecurring Cost Studies (ENRC)

The ENRC provides nonrecurring TELRIC data for all UNEs and interconnection services. The ENRC studies are delineated in Exhibit TKM-03. These cost studies properly reflect the TELRIC principles and are consistent with the requirements of the FCC. In addition, the cost data are consistent with the recent rulings of the Eighth Circuit.

Other Methodology Issues

My testimony also discusses three general methodology issues that are relevant to all of the costs produced by the cost models:

- Fill factors
- Cost of Money
- Depreciation

Other methodology issues specific to the unbundled loop will be discussed in detail in the testimony of Mr. Richard Buckley.

The Qwest TELRIC Studies

In this docket, Qwest is presenting recurring and nonrecurring costs for UNEs, interconnection services, collocation, line sharing, and ancillary services. My testimony presents recurring TELRIC data produced by the ICM for the following elements:

- Unbundled Loop (including network interface device and extension technology)
- Switching
    - Local Switching (port and usage)
    - Tandem Switching
- Transport
    - Tandem Switched Transport
    - Direct Trunked Transport
    - Shared Transport
    - Entrance Facilities
    - Multiplexing
    - Unbundled Dedicated Interoffice Transport (UDIT)
    - Extended - UDIT
- Database Services (8XX Database and LIDB)
- Signaling

In addition, my testimony presents cost studies including, but not limited to, the following additional elements:

- Vertical Features
- UNE-P (nonrecurring)
- Digital-capable Loop (DS1 and DS3)
- Distribution Subloop
- Building Cable
- DS1 Capable Feeder Loop
- Unbundled Dark Fiber
- Digital Lineside Port

- DS1 Primary Rate Interface ISDN Trunk Port
- InterNetwork Calling Name (ICNAM)
- Low Side Channelization
- Category 11 Mechanized Record
- Customer Transfer Charge (nonrecurring)

Line Sharing

Line Sharing is defined by the FCC as a UNE. Line Sharing involves the separate provisioning of the high frequency portion of the unbundled loop. Line Sharing costs consist of recurring and nonrecurring costs for collocating the CLEC's splitter equipment in Qwest's central offices, nonrecurring costs for installing the shared line, recurring costs for Operations Support Systems (OSS) and a separate recurring charge for the cost of the loop. The CLEC has several options for collocation that are depicted in the Line Sharing collocation study, Exhibit TKM-04. The Line Sharing OSS study is included as Exhibit TKM-05.

The Collocation Model

The Collocation Model provides cost data for caged, cageless and virtual collocation elements. The Collocation Model is included as Exhibit TKM-06 of my testimony. This exhibit contains a schematic diagram that depicts the collocation cost elements.

The Collocation Model calculates the forward-looking recurring and nonrecurring incremental costs for collocation elements. The nonrecurring costs include the cost of installing equipment on the CLEC side of the demarcation point. This equipment is dedicated to CLECs and is not shared with Qwest. Recurring elements include the small ongoing costs associated with maintaining the collocation equipment that is dedicated to CLECs, along with the investment-related costs of equipment that is shared between CLECs and Qwest.

The treatment of recurring and nonrecurring costs in the collocation model is consistent with the FCC's collocation principles, as outlined in its Second Report and Order in CC Docket No. 93-162. The Collocation Model inputs are based on an analysis of actual collocation jobs in Qwest central offices. The use of actual cost data is consistent with using realistic, achievable conditions to calculate costs on a forward-looking basis.

Conclusion

The Commission should set prices for UNEs and interconnection services based on the TELRIC data summarized in Exhibit TKM-01 of my testimony. The Qwest TELRIC studies reflect the proper application of the FCC's TELRIC principles, calculating forward-looking costs based on realistic, achievable inputs. In addition, the Commission should adopt the geographic deaveraging plan proposed by Qwest, which is also consistent with FCC rules.

I. IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS AND POSITION WITH QWEST CORPORATION.

A. My name is Teresa K. (Terri) Million. My business address is 1801 California Street, Room 4450, Denver, Colorado 80202. I am employed by Qwest Corporation as a Director, Service Costs, in the Policy and Law Department. In this position, I am responsible for preparing testimony and testifying about Qwest's cost studies in a variety of regulatory proceedings.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes. On April 24, 2000, I filed direct testimony in Phase I of this proceeding. I also filed direct testimony in Phase II of this proceeding on October 11, 2000. That testimony has been withdrawn and is being replaced in its entirety with the direct testimony being filed here.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present Qwest's Arizona recurring incremental cost data for unbundled network elements and interconnection services. These data are utilized as the basis for the pricing recommendations contained in the testimony of Ms. Barbara Brohl and Mr. Robert Kennedy.

My testimony introduces and describes the Qwest Integrated Cost Model (ICM). The ICM is an integrated cost model that calculates the recurring Total Element Long Run Incremental Cost (TELRIC) for the major unbundled network elements (UNEs) and interconnection services. I also submit costs for the Customer Transfer Charge in accordance with the remand of that issue by the United States District Court in *U S WEST Communications, Inc. v. Jennings*, 46 F. Supp. 2d 1004 (D. Ariz. 1999). Additionally, I describe Qwest's proposal for permanent deaveraging of the UNE loop, introduce the Qwest Collocation Model and Line Sharing study, and discuss other recurring cost studies that are not part of the ICM. The Collocation Model is an integrated model that calculates both recurring and nonrecurring TELRIC for collocation services.

I also introduce and describe the Qwest Enhanced Nonrecurring Cost Studies (ENRC) and present Qwest's Arizona nonrecurring costs. The ENRC calculates the nonrecurring TELRIC for all UNEs and interconnection services. These data are also utilized as the basis for pricing recommendations contained in the testimony of Ms. Barbara Brohl and Mr. Robert Kennedy.

Q. ARE OTHER QWEST WITNESSES PROVIDING TESTIMONY REGARDING COST ISSUES?

A. Yes. Mr. Richard Buckley provides testimony that describes in detail the methodology and assumptions included in the Loop Module of the ICM. Mr. James Overton's testimony provides support for the engineering and network inputs used in the ICM Loop Module, the Collocation Model and the Line Sharing study. Ms. Renee Albersheim provides testimony describing Qwest's Operations Support Systems (OSS) expenditures associated with Line Sharing.

III. TELRIC PRINCIPLES

Q. PLEASE SUMMARIZE THE OVERALL ECONOMIC PRINCIPLES THAT ARE APPLIED IN QWEST'S TELRIC STUDIES.

A. The Qwest TELRIC studies identify the *forward-looking* direct costs that are caused by the provision of an interconnection service or network element in the *long run*, plus the incremental cost of shared facilities and operations. These studies identify *total element* costs – the average incremental cost of providing the entire quantity of the element. The assumptions, methods, and procedures used in Qwest cost studies are designed to yield the forward-looking *replacement* costs of reproducing the telecommunications network, considering the most efficient, least-cost technologies that are currently available.

Q. HOW IS THE CONCEPT OF LONG RUN CONSIDERED IN THE QWEST TELRIC STUDIES?

A. The Qwest TELRIC studies consider a time period over which all inputs are variable.[1] In this context, long run does not relate to a specific period of time (e.g., five years, ten years, etc.) but refers to a time period long enough that all inputs, including investments, are variable. From a practical standpoint, this means that in a long run study all investments related to the network element are considered variable, and the costs associated with these investments are included in the TELRIC study results.

Q. PLEASE EXPLAIN HOW THE TELRIC STUDIES IDENTIFY REPLACEMENT COSTS FOR THE TOTAL ELEMENT.

A. The Qwest TELRIC studies consider the costs of a network that is "built from scratch," assuming the existing location of network "nodes" or switches. These long run studies identify the total "replacement" costs of serving all current and anticipated demand, rather than the costs of adding equipment to an existing network to meet a small increment in demand. Thus, the studies consider the efficiencies associated with building a network to serve total demand, assuming a single carrier.

In the Qwest TELRIC studies, the increment studied is the total quantity of the network element. Therefore, the studies calculate the average cost for all units of output, rather than the marginal cost of the next or last unit of output.

[1] *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, FCC 96-325, CC Docket Nos. 96-98, 95-185, First Report and Order at ¶ 692 (Rel. August 6, 1996) ("First Report and Order").

Q. PLEASE EXPLAIN HOW THE <u>FORWARD-LOOKING</u> CONCEPT IS CONSIDERED IN THE QWEST TELRIC STUDIES.

A. The Qwest TELRIC studies identify the forward-looking costs that are likely to be incurred in the future. These studies consider the least-cost, forward-looking technologies and methods of operations that are currently available and practical to deploy in the network, given current and anticipated demand for the total element. Thus, in calculating appropriate TELRIC costs, it is important to consider, as Qwest has, what is currently being deployed in the system, as well as, what will be used by the competitor on a forward-looking basis.

Q. IS IT IMPORTANT THAT TELRIC STUDIES CONTAIN REALISTIC FORWARD-LOOKING ASSUMPTIONS?

A. Yes. A TELRIC study must provide a realistic estimate of forward-looking costs. Thus, a TELRIC study must provide an estimate of the forward-looking costs that Qwest *would be likely to incur* in the future. Consistent with this standard, the Qwest TELRIC studies use the latest technologies and methods of operations that are currently available. Only technologies that are commercially available and that are currently being deployed in the industry today are included in the studies. The studies do not rely on technologies that might be available in the future. There is too much uncertainty about unproven, potential technologies to permit their use in cost studies, including uncertainty about whether the technologies will actually become available, the potential cost of the technologies, and the potential uses of the technologies. Nor do the studies rely exclusively on "state-of-the-art" technologies that may be available, but are impractical to deploy in every situation.

For example, fiber-based DS1 technologies are considered to be "state-of-the-art." However, in circumstances where utilization is low (e.g., there is demand for only 1 or 2 DS1s at an end-user location) and is not likely to increase in the foreseeable future, it is impractical to deploy fiber rather than copper-based DS1s. This is because a fiber-based DS1 technology, such as OC3, provides capacity for 84 DS1s at only one location unless appropriate electronics are deployed in multiple end-user locations. The cost of these electronics causes fiber to be far more costly, and thus impractical, to deploy than copper on a per-DS1 basis in low demand situations.

Some parties may advocate the use of a theoretical, least-cost TELRIC methodology that employs unrealistic assumptions to produce low cost estimates, such as assuming high demand for DS1s at each end-user location to justify an all-fiber network. The Commission should reject these "fantasy cost" estimates, because pricing based on these studies would prevent Qwest from recovering its legitimate, realistic costs (e.g., by either not assuming enough cost for necessary electronics or by overstating system utilization). No firm could continue to invest in infrastructure if it were forced to sell its services based on "fantasy" costs that are below the actual costs the firm incurs to build the infrastructure.

In its TELRIC studies, Qwest uses current market prices to determine the costs for equipment and materials. Placement costs are based on the expenditures that the network organization currently incurs to perform the relevant functions, based on actual contracts with vendors that do work for Qwest in Arizona. Expense factors are based on currently incurred costs adjusted for known or anticipated changes. Each assumption is designed to reflect the forward-looking cost of placing the network.

Q. CAN YOU PROVIDE SOME EXAMPLES OF HOW APPROPRIATE FORWARD-LOOKING TECHNOLOGIES ARE CONSIDERED IN QWEST'S TELRIC STUDIES?

A. Yes. In developing investment costs, Qwest models forward-looking, least-cost network designs. For example, the ICM Loop Module described by Mr. Buckley considers the least-cost, forward-looking mix of copper, fiber and integrated pair gain equipment. Thus, the model considers not just "state-of-the-art" technology (e.g., fiber), but also the "least-cost" way of providing the element in a given network application. For unbundled loops, copper facilities represent the least-cost technology for shorter loops and where demand is relatively low, while fiber and electronics represent the least-cost technology for longer loops and where demand is relatively high.

The Switching Module of ICM develops switching investment for each service, using only digital switch technology. The switching module does not use older, less efficient technologies, such as analog switching equipment. In the Transport Module, interoffice facilities are modeled assuming 100% fiber and SONET based equipment. Signaling costs are developed based on the forward-looking equipment in a Signaling System 7 (SS7) network.

The Qwest TELRIC studies also consider forward-looking operating expenses. Qwest adjusts its recent expense information to develop annual cost factors that estimate forward-looking costs. Using historical information as a starting point, Qwest adjusts its expense factors to account for future efficiencies and expected inflationary/deflationary price impacts.[2]

Q. HOW SHOULD THE QWEST TELRIC STUDIES BE UTILIZED IN THIS PROCEEDING?

A. The Commission should use the TELRIC data presented in my testimony to set prices for UNEs and interconnection services. That is, this data, including an allocation of common costs, should be used as the basis for the UNE and interconnection service prices presented in the testimony of Ms. Barbara Brohl and Mr. Robert Kennedy.

IV. THE QWEST INTEGRATED COST MODEL

Q. PLEASE BRIEFLY DESCRIBE THE INTEGRATED COST MODEL (ICM).

[2] This is accomplished via the "estimated cost savings" and "inflation" inputs in the Expense Factor Module.

A. The ICM is a cost model developed by Qwest that is designed to estimate the *recurring* TELRIC for UNEs and interconnection services. The ICM produces recurring costs for the major UNEs and interconnection services, including the unbundled loop, switching, transport and other elements listed below in Section VII of my testimony.

A. ICM Model Description

Q. IS QWEST PROVIDING A MANUAL THAT PROVIDES A DETAILED DESCRIPTION OF THE ICM AND ITS MODULES?

A. Yes. Qwest is filing the ICM User Manual, which instructs the user about how ICM operates. This manual contains detailed instructions for running ICM, including, for example, how to change inputs to the model. This manual also provides detailed documentation that describes each of the five ICM modules (i.e., switching, loop, transport, capital costs and expense factors).

Q. HOW IS THE ICM DESIGNED?

A. The ICM runs each of the modules and inserts the results from each module into the Output Workbook. The Output Workbook uses the results of each module, along with special study inputs, to calculate the TELRIC for each UNE and interconnection service. First, investment-related factors are applied to investments to provide the investment-related monthly costs (e.g., depreciation, cost of money, income tax and maintenance) for each UNE and interconnection service. Second, the expense-related factors are applied to the investment-related costs to yield the monthly cost for operating expenses, such as product management and network operations and support. Third, the Output Workbook sums all of the monthly costs to provide the monthly TELRIC for the UNE. Finally, the Output Workbook provides an allocation of common costs (e.g., executive, planning, other general and administrative expenses) to each UNE and interconnection service.

Q. DOES THE ICM ALLOW THE USER TO MODIFY INPUTS?

A. Yes. The ICM provides input forms for each of the modules, which allow the user to change key input assumptions. The input forms display the default value for each input item and allow the user to override these values if desired. For example, the Loop Module provides input forms that allow the user to view the default values that are used to reflect how often different placement methods are used to place buried cable and, if desired, to change those values to reflect different assumptions about placement methods.[3] After all desired changes are made to the inputs, the user can easily rerun the ICM to produce UNE cost results based on the new user assumptions.

Q. DOES THE ICM REPRESENT A SIGNIFICANT IMPROVEMENT OVER PREVIOUS UNE TELRIC MODELS?

[3] Mr. Buckley provides a thorough discussion of Loop Module inputs in his testimony.

A. Yes. The ICM calculates the costs for UNEs using the same basic methodological approach that was used in previous Qwest UNE cost studies filed before this Commission. However, the ICM model itself represents a significant improvement over previous UNE cost models for several reasons:

- The ICM is **simple** and **user friendly.** The model can be run on most windows-based personal computers.[4] It contains a "point and click" interface that is easily navigated by the user. The user can view results, study assumptions, study inputs, etc., and make changes when desired. A user can run a new TELRIC study, based on the user's specifications, in a relatively short period of time. In sum, the ICM is an easy to use model that does not require users to be trained as model "experts." Any interested party can run the model by following the user guide instructions.

- The ICM is an **open model.** The model makes it easy for the user to view the study inputs, calculation processes, and output results. All aspects of the model are open to investigation by the user – eliminating any "black box" concerns.

- The ICM is **integrated.** In the past, costs for different UNEs had to be calculated in separate models. For example, switching costs were calculated via the Switching Cost Model (SCM) and Windows Personal Computer Cost

Calculator (WINPC3) models. Loop costs were calculated using the Regional Loop Cost Analysis Program (RLCAP) and WINPC3. Transport costs were calculated in a separate transport model. With ICM, costs for the major UNEs, including the loop, switching and transport, are calculated in the same easy to use integrated model. ICM replaces WINPC3 and performs the functions previously provided through separate runs of WINPC3. The integrated nature of the ICM assures that all annual cost factors are applied consistently.

B. ICM Results

Q. DOES ICM PROVIDE UNE COST RESULTS THAT REFLECT THE PROPER APPLICATION OF TELRIC PRINCIPLES?

A. Yes. The ICM and its modules contain recommended default inputs. For example, as described below in Section VI of my testimony, the ICM utilizes fill factors that are designed to provide a "reasonable projection of actual total usage of the element," as required by the FCC.[5] In addition, my discussion of the ICM modules, in this section, explains how the key inputs are determined. If the model is run with these inputs, it produces results, as delineated in Exhibit TKM-02, that properly reflect the TELRIC principles described earlier in my testimony. The ICM model, using the default inputs, provides a reasonable estimate of the

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[4] See documentation for specific computer requirements.

[5] First Report and Order at ¶ 682.

recurring TELRIC for UNEs in Arizona. These results should be used by the Commission to set recurring prices for UNEs and interconnection services.

C. ICM Modules

1. The Loop Module

Q. WILL YOU DESCRIBE THE ICM LOOP MODULE IN YOUR TESTIMONY?

A. No. Mr. Buckley provides a detailed description of the ICM Loop Module in his testimony.

2. The Switching Module

General Description

Q. PLEASE BRIEFLY DESCRIBE THE SWITCHING MODULE OF ICM THAT IS USED TO CALCULATE SWITCHING COSTS.

A. The Switching Module of the ICM calculates costs utilizing the Switching Cost Model (SCM) program, which is incorporated into the ICM. The purpose of SCM is to provide per-unit switching investments for various services, features and functions.

SCM contains four major modules. **SCM Core** calculates busy hour investments by switching function. SCM Core uses engineering information, along with the discounted vendor price for various equipment components, to develop a cost for each function performed by the switch. SCM Core produces costs for functions such as:

- Investment per analog line
- Investment per processor millisecond
- Investment per network CCS
- Investment per 3-port conference circuit

SCM Features develops unit investments for vertical features, such as custom calling services.[6] SCM Features uses SCM Core outputs, along with feature usage data, to calculate the cost of a feature, usually on an investment per line basis. For example, Three Way Calling investment is developed by using the SCM Core outputs for "Investment per Millisecond" and "Investment per 3 Port Conference Circuit CCS," along with usage data (e.g., average Three Way Calling busy hour CCS and calls) to derive the Three Way Calling investment per line.

SCM Calls develops the switching cost per line, and the switching cost for various types of calls:

- Line to line
- Line to trunk

[6] The costs for individual vertical features are included in one of the additional cost studies, and are not included in the ICM output. However, the investments are calculated in the SCM.

- Trunk to line
- Trunk to trunk

SCM Calls develops these costs on a per busy hour attempt and per busy hour conversation minute basis, utilizing SCM Core outputs along with data regarding how much of these outputs are consumed, for example, to set up a call.

The **SCM Usage** module converts busy hour unit investments from SCM Calls into an investment per call setup and per minute of use for various types of calls.

Q. WHAT ARE THE PRIMARY COST DRIVERS THAT IMPACT THE SCM RESULTS?

A. The primary cost drivers for switching equipment include:

- The price charged to Qwest by vendors such as Lucent Technologies
- The busy-hour demand per line and per trunk within a switch
- The number of lines served by the switch
- The trunk to line ratio required to meet the demand on the switch

Q. HOW IS THE DATA FROM THE SWITCHING MODULE USED IN THE ICM?

A. The Switching Module calculates switching investments for local switching, tandem switching, end office analog ports, and vertical features.[7] These investments are converted to monthly or per minute of use costs in the ICM Output Workbook.

[7] As noted earlier, the costs for individual vertical features are included in one of the additional cost studies, and are not included in the ICM output. However, the investments are calculated in the SCM.

Q. DOES THE QWEST ICM MANUAL CONTAIN A MORE DETAILED DESCRIPTION OF THE SWITCHING MODULE?

A. Yes.

Switching Module Inputs

Q. WHAT ARE THE KEY INPUTS TO THE SWITCHING MODULE?

A. The key inputs in the Switch Module of ICM are: the Growth Rate, the Administrative Fill Factor for Analog Lines, the Administrative Fill Factor for Integrated Digital Lines, the Administrative Fill Factor for Digital Trunks, and the Average Business Day Equivalents per Year. In addition, the user can make changes to the vendor discount rates that are applied in the ICM for Nortel, Ericsson and Lucent switches. Descriptions of these discounts are provided in the ICM User Manual.

Q. HOW DOES QWEST DETERMINE THE APPROPRIATE GROWTH RATE TO USE IN THE SWITCH MODULE?

A. The default growth rate input value is based on a five year forecast provided by Local Markets Forecasting using the Integrated Forecasting Tool. First, the forecasted growth in switched analog and integrated digital lines for 1999 through 2003 is determined. Next, this multi-year forecast is divided by 5 to derive an annual growth amount. The annual growth amount is then divided by the base-year demand (i.e., 1999) to determine the growth rate. The growth rate input value is 4.8984%.

Q. PLEASE EXPLAIN WHAT YOU MEAN BY A "FILL FACTOR."

A. "Fill" is an industry term for the assumed utilization to be placed on a piece of investment (e.g., loop plant or a switch) when determining the unit cost.

Q. HOW DOES QWEST DEVELOP THE RECOMMENDED DEFAULT ADMINISTRATIVE FILL FACTORS FOR ANALOG LINES, INTEGRATED DIGITAL LINES AND DIGITAL TRUNKS?

A. Administrative spare capacity for analog and digital lines is used to account for:

- Malfunctioning equipment (e.g., ports)
- Lines set aside for testing
- Lines used for administrative purposes (e.g., lines to Switching Control Center, Network Administration Center, etc.)
- Lines reserved for special events, e.g., once a year events such as state fairs (Wire center dependent)
- Lines set aside in case the line forecast is exceeded prior to a scheduled line growth job
- Churn of dedicated inside plant (lines that are disconnected but left in place for a limited time period awaiting a reconnect at the same location).

Based on an analysis of these various administrative needs, Qwest estimates that the administrative line fill factor for both analog and digital lines is 95%, or 5% administrative spare capacity.

Digital trunk spare capacity occurs because of the unused capacity due to the modularity of trunk ports. The term "modularity" refers to the minimum amount of capacity that must be added to meet the next increment of demand once current capacity reaches exhaustion. Thus, as each new trunk group is added to meet demand, a certain amount of spare capacity will exist until demand "catches up with" available capacity. The average number of trunks per trunk group is 64, of which Qwest estimates an average of 12 trunks (half of a DS1) will not be in use at any given time because of the effect of modularity. Accordingly, the administrative fill factor due to modularity equals 52 / 64, or 81%.

Q. HOW ARE THE VENDOR DISCOUNTS IN THE SWITCHING MODULE DETERMINED?

A. The vendor discounts are based on actual vendor contracts that Qwest has negotiated with switch vendors, such as Lucent, Ericsson and Nortel. The latest available vendor discounts are entered into the ICM as default values and are contained on pages marked "Vendor Proprietary" in Exhibit TKM-02.

3. Transport Module

General Description

Q. PLEASE DESCRIBE THE TRANSPORT MODULE.

A. The Transport Module is used to estimate the investment in transmission and channel termination equipment needed to provide transport between two switching offices. The Transport Module calculates dedicated and switched transport costs.

Q. WHAT IS INCLUDED IN THE TRANSMISSION (MILEAGE SENSITIVE) INVESTMENT?

A. The transmission investment includes the cost of fiber facilities and intermediate multiplexing equipment.

Q. WHAT IS INCLUDED IN THE TERMINATION (FIXED) INVESTMENT?

A. Channel termination investment includes the electronic equipment located at the switch location (where the route originates and terminates) that converts electronic signals into optical signals, as well as the equipment used to multiplex or de-multiplex a signal.

Q. WHAT DATA DOES THE TRANSPORT MODULE USE TO ESTIMATE TRANSPORT COSTS?

A. The Transport Module calculates costs using the following files and data:

- Point pair files – These files include all combinations of routes between any two wire centers in Arizona. This data includes originating and terminating wire centers and number of circuits connecting them.
- The SONET transport model contains three forward-looking transport configurations: point-to point, linear, and ring.

- Investments – This file contains material costs for equipment used in the network. This data is based on Qwest's current vendor contracts.
- Investment Profiles – This file contains the distribution of transport configurations used in the model. These profiles vary by the size of the wire centers where the point pairs terminate.

These data are described in more detail in the Transport Module of the ICM User Manual.

Q. PLEASE EXPLAIN THE GENERAL METHODOLOGY USED TO CALCULATE TRANSPORT MODEL INVESTMENTS.

A. For every point pair (i.e., any combination of connections between two wire centers) in Arizona, the transport model calculates investment per circuit for channel termination equipment, fiber optic facilities, and intermediate multiplexing equipment. The investments associated with each point pair are sorted into mileage bands. For each mileage band, the model calculates fixed (termination) and distance sensitive (transmission) investments. These investments are converted into costs in the ICM Output Workbook.

Transport Module Inputs

Q. WHAT ARE THE KEY INPUTS IN THE TRANSPORT MODULE?

A. The key inputs in the Transport Module are the utilization, or fill factors and the vendor costs for various types of equipment (e.g., the cost per foot for fiber or the cost of a fiber distribution panel).

Q. HOW ARE THE RECOMMENDED DEFAULT UTILIZATION FACTORS DEVELOPED?

A. The utilization factors for D4 channel banks, M 1/3 multiplexers, and fiber terminals are developed from data in the TIRKS (Trunk Integrated Record Keeping System) database. TIRKS is a system Qwest uses for order control and integrated record keeping which allows for highly mechanized provisioning of complex design services. The TIRKS database is a repository for the inventory, capacity and utilization information related to services such as SONET-based interoffice facilities. The utilization factors are calculated based on the demand for, and capacity of, the equipment tracked in TIRKS. The Transport Module allows different utilization inputs depending on whether the traffic is switched or dedicated. The utilization factors for fiber and conduit are developed using information provided by subject matter experts in Qwest's network organization.

Q. HOW ARE THE INVESTMENT DEFAULTS USED IN THE TRANSPORT MODULE DEVELOPED?

A. The default material investments used in the Transport Module for the equipment and facilities described above are found in vendor contracts or price lists. The material investments for the standard transport configurations are determined by engineers whose job it is to develop the transport configurations currently in use at Qwest. Thus, the material prices used as defaults in the ICM reflect the current prices that Qwest must pay vendors to purchase equipment used to provide transport.

Q. DO YOU RECOMMEND THE USE OF THE DEFAULT INPUT VALUES FOR TRANSPORT?

A. Yes. The default input values in the Transport Module are generated from actual vendor contracts and price lists, using currently deployed transport configurations developed by subject matter experts, and capacity and utilization information from TIRKS. Qwest believes the data obtained from these sources is the most current and forward-looking data available.

4. Capital Cost Module

Q. WHAT ARE THE KEY INPUTS IN THE CAPITAL COST MODULE?

A. The key inputs to the Capital Cost Module are cost of money and depreciation lives. The ICM allows the user to select the Qwest economic or state-prescribed cost of capital, or to enter a specific cost of equity, cost of debt and debt to capital ratio. The ICM also allows the user to select the Qwest economic, state-prescribed or FCC-prescribed depreciation lives and network salvage values, or to change the depreciation lives and net salvage for every plant account. The user can also choose either Equal Life Group or straight-line depreciation. I will discuss depreciation and cost of money later in my testimony.

5. Expense Factors Module

General Description

Q. DOES THE ICM INCORPORATE AN ENHANCED PROCESS FOR THE CALCULATION OF ANNUAL EXPENSE FACTORS?

A. Yes. The Factors Module of ICM includes several enhancements (over previous TELRIC studies filed in Arizona) that make it easy to understand the factor application process and to audit the results.[8]

In the enhanced Factors Module:

- Expenses and investments are pulled directly from standard accounting reports;
- User-defined efficiency and inflation inputs can be selected;
- The factor calculation process starts with standard accounting report results (i.e., the books of the firm). Directly assigned costs (i.e., costs that are directly assigned to elements) and costs that are not applicable to TELRIC studies are removed, and these subtractions are explicitly displayed in the Factors Module. This provides the user with a clear understanding of which costs are included and which costs are not included in the factors;
- All calculations are contained in one set of worksheets.

Q. DO THE ENHANCEMENTS TO THE EXPENSE FACTORS MODULE MAKE IT EASIER TO ENSURE THAT DOUBLE COUNTING OF COSTS DOES NOT OCCUR?

A. Yes. The new model is designed to help the user ensure that double counting (or omission) of expenses does not occur. The cost factors are based on historical cost relationships,[9] and use the books of account as a starting point. All costs on the books of Qwest are accounted for – costs are explicitly removed if directly assigned in another study or if not applicable to TELRIC studies. The user can clearly see the total costs (booked costs), the removed costs, and the costs that remain in the factors. Thus, for example, the user can see that the business office costs that are separately identified in a nonrecurring cost study are removed from the factors and not double counted.

Q. DOES THE ICM EXPENSE FACTOR MODULE ASSURE CONSISTENCY OF FACTOR APPLICATION?

A. Yes. Prior to the development of an integrated cost model, cost analysts had to apply cost factors separately in each cost study. While the analysts have always sought to ensure that factors were consistently applied across studies, the ICM makes this process much easier. Since the costs for all UNEs and interconnection services developed in ICM are calculated in the same module, the user can assure that the cost factors are consistently applied to all UNEs and interconnection services.

Expense Factor Module Inputs

Q. PLEASE DESCRIBE THE KEY FACTORS MODULE INPUTS.

A. The key inputs to the Factors Module are the efficiency and inflation/deflation factors. In the Factors Module input screen, the user may input a "Cost Savings Value" and an "Inflation Rate." The Cost Savings Value estimates the gains

[8] As compared with previous TELRIC studies filed in Arizona.

[9] As noted above, factors are adjusted to account for inflation/deflation and efficiency gains.

expected in productivity or efficiency, while the Inflation Rate estimates the amount of inflation (or deflation) anticipated. These values can be applied on an account-specific basis, or applied uniformly to all accounts.

Q. PLEASE DESCRIBE HOW THE QWEST DEFAULT FOR THE COST SAVINGS VALUE IS DEVELOPED.

A. The Cost Savings Value input is designed to reflect efficiency gains. This input is based on the X-Factor productivity estimates on page 55 of the CC Docket No. 97-159. The base expenses are at a 1999 level, so this input reflects estimated efficiency gains resulting from increased labor productivity and improved technologies for a two-year period (1999 to 2001). The calculation of Qwest's Cost Savings Value is a weighted average of the X-Factor productivity estimates reported by the FCC, AT&T and the United States Telephone Association (USTA) and results in a two-year efficiency gain of 10.25%. This default percentage was selected as an aggressive estimate of future efficiency, relative to Qwest's historical trends.

Q. PLEASE DESCRIBE HOW THE QWEST DEFAULT FOR THE INFLATION FACTOR IS DEVELOPED.

A. The 8.78% inflation input is based on the Wage & Salary Index prepared by the economic consulting firm, Joel Popkin and Company. The value represents an estimate of inflation between 1999 and 2001, based on Qwest-specific circumstances including Qwest's union labor contract and compensation and benefits practices. This input compares to a Consumer Price Index (CPI) of 6.04%, which includes more than wages and salaries and is based on national averages. Qwest's inflation rate is a reasonable input because it appropriately represents the environment in which Qwest must operate.

Q. DO YOU RECOMMEND USE OF THE DEFAULT INPUTS FOR EFFICIENCY AND INFLATION?

A. Yes. I believe that these inputs reasonably reflect anticipated gains in efficiency and an inflation value appropriate for use in forward-looking cost models and studies that take into effect the environment in which Qwest operates.

V. THE ENHANCED NONRECURRING COST STUDIES (ENRC)

Q. PLEASE BRIEFLY DESCRIBE THE ENRC.

A. The ENRC is a collection of cost studies developed by Qwest designed to estimate the *nonrecurring* TELRIC for all UNEs and interconnection services. The ENRC calculates nonrecurring costs for provisioning and installation activities based on time estimates and probabilities of occurrence of the tasks performed to accomplish each function. The time estimates and probabilities for each task are presented in detail in the ENRC workpapers. (Exhibit TKM-03)

Q. IS QWEST PROVIDING A MANUAL THAT PROVIDES A DETAILED DESCRIPTION OF THE ENRC?

A. Yes. Qwest is filing the ENRC User Manual, which instructs the user about how to make changes to inputs.

Q. HOW IS THE ENRC DESIGNED?

A. The ENRC calculates the direct nonrecurring costs for each UNE and interconnection service based on time estimates to perform tasks, probabilities that tasks will be performed, and labor rates associated with each job function. ENRC then applies expense factors to the direct nonrecurring costs to provide the TELRIC for each UNE and interconnection service. Finally, an allocation of common costs is assigned to each nonrecurring cost element.

Q. DOES THE ENRC ALLOW THE USER TO MODIFY INPUTS?

A. Yes. ENRC allows the user to view the work times, probabilities, and labor rates and to override these values if desired. After all desired changes are made to the inputs, the user can easily recalculate the ENRC to produce cost results based on the new user assumptions.

Q. DOES THE ENRC PROVIDE UNE COST RESULTS THAT REFLECT THE PROPER APPLICATION OF TELRIC PRINCIPLES?

A. Yes. The ENRC contains inputs based on Qwest's current experience in processing orders and provisioning network plant. The Qwest nonrecurring TELRIC studies identify the forward-looking, nonrecurring costs that Qwest is likely to incur in provisioning UNEs. These studies consider the actual processing and provisioning activities that are either in place today or scheduled to be implemented, rather than theoretical provisioning methods based on future hypothetical technologies or networks that are not currently deployed. It includes changes anticipated by subject matter experts in processing and provisioning. It also includes certain assumptions and expectations for mechanization based on the development of Operations Support Systems (OSS) interfaces for use by the CLECs. If the studies use these assumptions, they produce results, as delineated in Exhibit TKM-03, that properly reflect the TELRIC principles. These results should be used by the Commission to set nonrecurring prices for UNEs and interconnection services.

Q. PLEASE DESCRIBE THE PROCESS QWEST USES TO VALIDATE THE ASSUMPTIONS AND INPUTS USED IN ITS MODELS.

A. Qwest utilizes a variety of approaches to ensure the reasonableness of its TELRIC estimates and assumptions. For example, component prices are taken directly from vendor quotes with Arizona specific loadings (e.g., sales tax) applied. Placement costs contained in Qwest's loop costing model are taken directly from actual network contracts with Arizona vendors. Assumptions are verified through discussions with internal experts about actual construction experiences and vendor bid responses, along with other relevant data. Since TELRIC, by its very nature, represents a rebuild of the total network, it is critical that all relevant available information be used to confirm model assumptions, inputs and logic. Qwest's cost analysts also spend extensive time reviewing cost data for related UNEs and for the same UNEs in other states to ensure that the models' results are within a range of reasonableness. As described by Mr. Buckley, Qwest has compared its TELRIC loop costs with loop cost data from other sources to assure that the results of the TELRIC study for the unbundled loop are reasonable.

VI. OTHER METHODOLOGY ISSUES

Q. WHAT METHODOLOGY ISSUES WILL YOU DISCUSS IN THIS SECTION OF YOUR TESTIMONY?

A. In this section of my testimony, I will address three general methodology issues:

- Fill factors
- Cost of Money
- Depreciation

These issues are relevant to all equipment-based costs produced by the ICM.

A. Fill Factors

Q. PLEASE DESCRIBE THE TYPES OF FILL FACTORS THAT COULD BE USED TO MODEL COSTS.

A. As I explained earlier in my testimony, "fill" is an industry term for the assumed utilization to be placed on a piece of investment (e.g., loop plant or a switch) when determining the unit cost. There are two types of "fill" that have been widely discussed in arbitration and cost proceedings: objective and actual fill.

"Objective" fill has historically been used to refer to the maximum utilization of a facility that can be achieved before reinforcement becomes necessary. The percentage for objective fill is usually something less than 100% because some capacity is set aside for maintenance and administrative purposes.

Forward-looking "actual fill" is the utilization that is actually projected to be experienced for the investment and is typically lower than the objective fill because of practical realities of network management and expected usage.

Q. WHY IS THE PROPER USE OF FILL FACTORS AN IMPORTANT ISSUE?

A. If fill factors are improperly applied in a TELRIC study, the results may be significantly over or understated. That is, the study results are highly sensitive to the fill factors that are used.

Q. WHAT TYPE OF FILL FACTORS ARE UTILIZED IN QWEST'S TELRIC STUDIES?

A. In the Qwest cost studies, loop, switching, and transport investments are calculated using ICM inputs that reflect projected actual fill factors. This same approach is used in Qwest's other cost studies, as well.

Q. COULD THE COMPANY EVER OPERATE AT AN OBJECTIVE FILL LEVEL?

A. Not efficiently. It is important to remember that objective fill represents the fill level at relief – the point at which demand for access to the network requires the company to reinforce facilities. If Qwest operated at objective fill, it would need to add facilities each time new demand for the facility arose – a scenario that is clearly impractical. For example, it would be extremely inefficient and expensive to add single or small units of switching capacity on demand. Instead, switching capacity is added in large "lumps," which represents the long-run, least-cost method of provisioning. Thus, the efficient switching network will always function at a level well below objective fill.

Q. WHY DO THE QWEST TELRIC STUDIES UTILIZE PROJECTED ACTUAL FILL, RATHER THAN OBJECTIVE FILL, IN COST CALCULATIONS?

A. For establishing prices that are based on cost, the use of objective fill would prevent a full recovery of costs. For example, assume a company places a 100 pair cable at a cost per pair of $100. The total cost of the cable would be $10,000. Let's further assume that the projected actual usage of this facility is anticipated to be 65%, or 65 of the 100 lines, and that the objective fill for the facility is 85%. The unit cost calculated using an 85% objective fill per customer and the unit cost calculated using the 65% projected actual fill per customer is illustrated in Table 1 below.

TABLE 1

	TOTAL	PROJECTED	OBJECTIVE

		USAGE	USAGE
1. Fill levels	100%	65%	85%
2. Pairs	100	65	85
3. Cost /Pair	$100	$100	$100
4. Total Cost	$10,000	$10,000	$10,000
5. Projected Cost/Unit (Line 3/Line 1)	$100	$154	$118

		Shortfall
Amount to Be Recovered = $10,000		
Amount Recovered at $118 with 65 Pairs	$ 7,670	$2,330
Amount Recovered at $154 with 65 Pairs	$10,000	$0

In this scenario, service is actually provided to 65 customers. If service is provided to these customers, the entire $10,000 would be recovered only if the price were set at $154. If the price were set at $118, based on costs derived from an objective fill, the firm would recover only $7670, leaving a $2330 shortfall. This represents roughly 23% of the original $10,000 investment.

No business could survive if it continued to invest in equipment with no expectation that the costs of the investment would be recovered. That is, no firm could invest $10,000 with the expectation it would only be able to recover $7670. Thus, it is critical that projected actual fill levels be utilized in TELRIC studies.

Q. DOES THE FCC'S FIRST INTERCONNECTION ORDER REQUIRE THE USE OF PROJECTED ACTUAL FILL FACTORS?

A. Yes. The FCC's First Report and Order stated that:

> Per-unit costs shall be derived from total costs using reasonably accurate "fill factors" (estimates of the proportion of a facility that will be "filled" with network usage); that is, the per-unit costs associated with a particular element must be derived by dividing the total cost associated with the element by a *reasonable projection of the actual total usage of the element.* (emphasis added)[10]

The use of projected *actual* fill factors results in a TELRIC that more nearly reflects the cost of actually providing a UNE or an interconnection service in Qwest's operating environment.

Q. COULD QWEST MAINTAIN ITS NETWORK WITH ACTUAL FILL LEVELS APPROACHING OBJECTIVE FILL LEVELS?

A. No. If fill factors are set too high, Qwest's ability to provide service to customers on demand is adversely impacted. For example, if Qwest were to engineer its loop feeder network so that actual fill levels would approach the level of objective fill – there would be a high probability that facilities would not be available upon customer request, resulting in held orders. This would not be in the best interests of Arizona consumers.

Please refer to Mr. Buckley's testimony for a further discussion of the treatment of fill in the TELRIC calculations for the unbundled loop.

Q. HAS THE ARIZONA COMMISSION AGREED IN THE PAST THAT OBJECTIVE FILL LEVELS ARE INAPPROPRIATE FOR USE IN TELRIC STUDIES?

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[10] First Report and Order at ¶ 682.

A. Yes. In its decision in the prior cost docket (Docket No. U-3021-96-448 Et Al.), the Commission rejected the use of objective fills in the cost studies, recognizing that an objective fill of 85% would not allow for any growth of the network. The Commission chose instead to use the "achievable average" fill factors of the Hatfield Model.[11] In view of the FCC's pronouncements relating to fill factors, Qwest believes that in this proceeding the Commission should adopt the realistic projected fill factors that Qwest is utilizing in its studies.

B. Cost of Money

Q. PLEASE BRIEFLY DISCUSS THE FORWARD-LOOKING COST OF CAPITAL.

A. The cost of capital (cost of money) represents the weighted average cost of debt and equity and represents a return on the forward-looking, least-cost investment that is included in a TELRIC analysis. However, this cost of capital should be calculated by factoring in an appropriate measure of risk. As competition enters the market, Qwest's risk increases. This should be reflected in Qwest's cost of capital, which will increase with increased risk.

Q. HAS QWEST USED A FORWARD-LOOKING COST OF MONEY IN ITS TELRIC CALCULATIONS?

A. No. The ICM allows the use of both a forward-looking and prescribed cost of money. Qwest believes that a forward-looking cost of money is appropriate for

[11] Docket No. U-3021-96-448 et al., Decision No. 60635, January 30, 1998, at p. 17.

use in TELRIC studies. However, in order to provide a conservative estimate of costs and to avoid a protracted debate over the appropriate cost of money, the cost results produced in this proceeding reflect the Arizona Commission's decision in the prior cost docket (Docket No. U-3021-96-448 et al.) regarding cost of money. Thus, Qwest's cost studies utilize a prescribed cost of money of 10.37%.

C. Depreciation Lives

Q. PLEASE BRIEFLY DISCUSS FORWARD-LOOKING DEPRECIATION.

A. Forward-looking TELRIC studies must consider the real economic depreciation lives of plant and equipment. These lives must reflect how long the plant and equipment is actually expected to be used on a going forward basis, based on today's competitive environment. If prices are to be based on a forward-looking cost, these costs should not reflect historical depreciation rates. Proper forward-looking depreciation lives should be used – lives that are often shorter than historical lives. The use of artificially long equipment lives understates depreciation expense, and effectively impairs the recovery of costs.

Q. WHAT DEPRECIATION LIVES HAS QWEST USED IN ITS TELRIC STUDIES?

A. While forward-looking depreciation rates are more appropriate to use than historically-based depreciation rates, Qwest realizes the potential for lengthy debate on this subject. Therefore, to properly reflect the expedited nature of this proceeding, Qwest has used the Commission's prescribed forward-looking depreciation lives in its cost models.

VII. THE TELRIC STUDIES

Q. PLEASE BRIEFLY DESCRIBE THE TELRIC STUDIES THAT QWEST IS SPONSORING IN THIS DOCKET.

A. Qwest is presenting recurring and nonrecurring costs for UNEs and interconnection services, collocation, line sharing and ancillary services. In this filing, I address the recurring costs for most UNEs and interconnection services, including the unbundled loop, switching and transport. I also address the nonrecurring costs for all of the UNEs and interconnection services filed, plus line sharing, collocation, and the permanent deaveraging of the UNE loop.

Q. HOW WILL YOU STRUCTURE YOUR DISCUSSION OF THE SEPARATE TELRIC STUDIES?

A. I will address each of the enumerated elements individually and, where applicable, discuss the TELRIC studies associated with each issue.

A. The ICM Elements

Q. PLEASE BRIEFLY DESCRIBE THE ICM UNE ELEMENTS.

A. As described earlier, the ICM produces recurring TELRIC data for the following elements:

- Unbundled Loop (including the NID and extension technology)
- Switching
  - Local Switching (port and usage)
  - Tandem Switching
- Transport
  - Tandem Switched Transport
  - Direct Trunked Transport
  - Shared Transport
  - Entrance Facilities
  - Multiplexing
  - Unbundled Dedicated Interoffice Transport (UDIT)
  - Extended - UDIT
- Database Services (8XX Database and LIDB)
- Signaling

The ICM results for these UNEs are displayed in Exhibit TKM-02.

1. UNE Loop Deaveraging

Q. DID THE ARIZONA COMMISSION MAKE A DETERMINATION REGARDING INTERIM DEAVERAGING IN PHASE I OF THIS PROCEEDING?

A. Yes. The Commission adopted Qwest's proposed "zone increment" method, based on Qwest's current retail zone structure, for establishing interim deaveraged rates. In doing so, the Commission agreed with Qwest that "Commission policy in setting retail rates needs to be taken into consideration in setting geographic deaveraged UNE rates."[12] However, in analyzing the parties' submissions in Phase I, the Commission also made it clear that it believed the proposals by Staff and AT&T "reflect actual costs better than the U S WEST [Qwest] proposal."[13] The Commission concluded that a gradual move to a cost-based rate structure would be more appropriate, yet consistent with the objectives of the Act.

Q. WHAT IS QWEST PROPOSING FOR UNE LOOP DEAVERAGING IN PHASE II OF THIS DOCKET?

A. Based on the Commission's order, Qwest is proposing a three-zone, cost-based, wire center deaveraging scheme using the cost results from the Loop Module of the ICM similar to the proposals preferred by the Commission in Phase I. (See Exhibit TKM-02)

Q. HOW WERE THE COSTS FOR THE THREE ZONES DETERMINED?

A. Qwest used the Loop Module to determine loop investment by wire center. The investments were then converted to cost by wire center in ICM. The wire centers were then ranked, by cost, and zones were determined by grouping them as follows: Zone 1, wire centers with costs $25.80 or less; Zone 2, wire centers with costs above $25.80 and up to $32.38; and Zone 3, wire centers with costs above

[12] *In the Matter of Investigation into U S WEST Communications, Inc.'s Compliance with Certain Wholesale Pricing Requirements for Unbundled Network Elements and Resale Discounts,* Docket No. T-00000A-00-0194 (Phase I), Decision No. 62753.

[13] Opinion and Order at p. 5.

$32.38. A weighted average cost was then calculated for each zone using Qwest's current line counts for each wire center. The statewide average loop cost using the ICM is $28.96. The weighted average costs were then grouped by zone to produce an average cost for each zone.

Q. ARE THERE ADVANTAGES TO QWEST'S PROPOSAL IN THIS PROCEEDING?

A. Yes. First, while Qwest still believes in the importance of consistency between retail and wholesale rates, the Commission has stated that it believes the wire center approach is a better reflection of cost-based wholesale pricing. The Qwest proposal in Phase II is cost-based and uses the same "ranking of wire centers by cost" approach that Staff and AT&T proposed in Phase I.

Second, both Staff and AT&T criticized Qwest in Phase I for proposing a method that resulted in 95% of lines being located within the Base Rate Area. The Qwest proposal in this phase results in more than half of the lines being located in Zones 2 and 3, i.e., 43% in Zone 1, 37% in Zone 2 and 20% in Zone 3.

Finally, Qwest's proposal results in rates that provide for gradual movement toward a cost-based structure for both retail and wholesale rates. While Qwest has effectively agreed to forego a move toward retail deaveraging as part of the Settlement Agreement and its attendant Price Cap Plan in Docket No. T-01051B-99-0105 ET AL., it preserves its ability to pursue retail deaveraging once the wholesale deaveraged rates have been established. Paragraph 2(c)(v) of Attachment A regarding Service Pricing Flexibility states that "[a]ll services in this Basket shall be continued statewide at the tariffed rate, unless or until the Commission orders retail geographic rate de-averaging, or unless Qwest demonstrates a cost difference for a new service on which to base the price difference." Under Arizona's current retail structure, the vast majority of customers in the Phoenix and Tucson areas reside in the lowest-priced Base Rate Area. In Qwest's wholesale deaveraging proposal most of the customers in those two cities will also fall into Zone 1 or Zone 2, the two lowest-cost zones, for wholesale purposes. Qwest's wholesale proposal provides for cost-based pricing by wire center in each of three zones, with about a $5.50 difference between Zones 1 and 2, and a $13.50 difference between Zones 2 and 3. Qwest believes that its proposal both addresses the Commission's concern about having wholesale zones reflect cost-based pricing, and its concern about the impact that wholesale rates might ultimately have on retail rates.

Q. WHAT ARE THE RATES DETERMINED BY THIS INFORMATION?

A. The deaveraged unbundled loop costs/rates are:

Zone 1	$23.07
Zone 2	$28.64
Zone 3	$42.14

Statewide Average $28.96

Q. DOES THIS CALCULATION OF THE UNBUNDLED LOOP UNE RATE INCLUDE WIRE CENTERS THAT QWEST IS PROPOSING TO SELL IN ARIZONA?

A. No. Recognizing that under a TELRIC methodology one could argue that wire centers that have been identified as being for sale should be excluded from forward-looking costs, I have calculated the unbundled loop UNE with the wire centers that are thus identified, excluded.

2. Switching

Q. DOES QWEST'S ICM PRODUCE TELRIC RESULTS FOR SWITCHING?

A. Yes. ICM produces recurring costs for Line and Trunk Ports and for Local and Tandem Switching Usage. Described in more detail in the Summary of Results in ICM (Exhibit TKM-02), the various types of unbundled ports provide access to the basic functionality of the switch as well as access to interoffice services. Local and Tandem Switching costs are determined on a per minute of use (MOU) basis for terminating traffic to an end office switch and for switching a call through a local tandem switch, respectively.

3. Transport

Q. DOES QWEST'S ICM PRODUCE A TELRIC FOR SHARED TRANSPORT?

A. Yes. ICM produces a recurring cost for Shared Transport. Shared Transport, as defined by the FCC, represents access to an ILEC's shared *interoffice facilities* (i.e., facilities that carry traffic between ILEC central offices) at costs that reflect the efficiencies of the ILEC. Shared Transport is available only in conjunction with unbundled switching, due to the fact that switches perform the important gatekeeper function for access to the shared transport network.[14]

The recurring costs for Shared Transport are included in the results summary of the ICM in Exhibit TKM-02. Please refer to the testimony of Ms. Barbara Brohl for a further description of Shared Transport service.

Q. IS QWEST FILING A NONRECURRING COST STUDY FOR SHARED TRANSPORT AT THIS TIME?

A. No. When a CLEC purchases shared transport, it must also purchase an unbundled switch port and switch usage. Qwest has not identified any additional nonrecurring costs for shared transport beyond the nonrecurring costs associated with unbundled switching. In the future, if any unique shared transport nonrecurring costs are identified, Qwest may file a nonrecurring cost study.

Q. PLEASE BRIEFLY DESCRIBE HOW SHARED INTEROFFICE FACILITIES ARE DIFFERENT FROM DEDICATED INTEROFFICE FACILITIES.

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[14] Switches include the routing tables that route traffic over the shared transmission network. Without this switch function, shared transport could not be provided.

A. Interoffice transport includes the facilities that provide links between all of the central offices on the Qwest network (i.e., both tandem and end office switches). *Dedicated* interoffice facilities are set aside specifically for the full use of one customer or set of customers and cannot be shared by traffic from multiple customers. *Shared* interoffice facilities are not dedicated to a specific customer, but are designed and engineered to handle switched traffic from all customers. Shared interoffice facilities, when used in connection with standard routing tables and central office switches, provide shared access to all of Qwest's switches.

Q. PLEASE COMPARE THE SHARED TRANSPORT TELRIC WITH THE DIRECT TRUNKED TRANSPORT (DTT) AND TANDEM SWITCHED TRANSPORT (TST) TELRIC STUDIES THAT QWEST IS FILING IN THIS PROCEEDING.

A. The Shared Transport, TST and DTT TELRIC studies all develop transport investment utilizing the Qwest Transport Model. Thus, investments of all three are developed using the same basic TELRIC costing approach. However, the Shared Transport study is different from the DTT and TST studies because Shared Transport is a distinct offering that is *defined differently* than Tandem Switched Transport and Direct Trunked Transport. The cost results reflect these differences.

Direct Trunked Transport represents a dedicated path between two switching offices. A DTT link is not shared by multiple customers and does not carry POTS switched traffic. Tandem Switched Transport represents a shared interoffice

Even when the xDSL services are provided by a Qwest affiliate, as part of the corporate family, common systems are used to track the network and provision service for the customer. Qwest then bills the affiliate pursuant to the FCC's Affiliate Transactions rules under Part 32 for the services (including systems) that it provides to the affiliate. If the affiliate requires any modifications to Qwest systems to meet its own needs it pays for those modifications separately, up front.

Q. WHAT RATE DOES QWEST PROPOSE TO USE FOR RECOVERY OF ITS LINE SHARING OSS COSTS?

A. Qwest proposes that the OSS costs for line sharing be recovered through a recurring monthly rate of $3.20 per line for each line that is shared with a CLEC. This approach to recovery of the OSS costs is based on guidance from the FCC at paragraph 144 of the Line Sharing Order:

> We find that incumbent LECs should recover in their line sharing charges those reasonable incremental costs of OSS modification that are caused by the obligation to provide line sharing as an unbundled network element. We believe that this guideline is consistent with the principle set forth in the *Local Competition First Report and Order* and incumbent LECs cannot recover nonrecurring costs twice. We also reaffirm the conclusions in the *Local Competition First Report and Order*, that the states may require incumbent LECs in an arbitrated agreement to recover such nonrecurring costs such as these incremental OSS modification costs through recurring charges over a reasonable period of time, and that nonrecurring charges must be imposed in an equitable manner among entrants. [Footnotes omitted].

Q. WHY DID THE FCC SUGGEST RECURRING RATES TO RECOVER UP-FRONT COSTS FOR THE LINE SHARING OSS?

A. The FCC cited estimates from the ILECs that ranged from three million to hundreds of millions of dollars as the costs to modify OSS for line sharing. It is likely that the FCC recognized that because of the large amount of cost required for such modifications, up-front recovery of these costs could discourage line sharing. To remedy the problem, the FCC suggestion allows recurring rates to distribute the cost over "a reasonable period of time."

Q. DOES THE USE OF RECURRING RATES FOR RECOVERY OF AN UP-FRONT COST CREATE ANY SPECIAL ISSUES?

A. Yes. First, the "reasonable period of time" has to be determined. Basic financial tenets would imply a recovery period that corresponds to the estimated life of line sharing. This would mean that a reasonable period would be an estimate of the useful life of line sharing – Qwest providing the voice service and the CLEC providing the DSL service. Although Qwest has requested such data from the CLECs in other jurisdictions and will attempt to obtain information in this proceeding, it has not received sufficient information to make such a projection based on CLEC input. Therefore, Qwest has estimated the useful life of OSS for line sharing based on the depreciation life of the underlying asset. In this case, the underlying assets are the computers that make up Qwest's OSS. These OSS assets reside in account 2124, General Purpose Computers, an account which the Arizona Commission has determined has an estimated depreciation life of five years. Thus, it is Qwest's position that it is appropriate to use a five-year useful life for calculating the cost of line sharing OSS. In addition, in today's rapidly changing technological environment, it is difficult to envision a useful life for a given technical solution that extends beyond five years.

The second issue is the demand over which the rate will be applied, for example, per line per month. In order to properly develop a recurring rate that will come reasonably close to recovering the cost, an estimate of the number of lines to be shared is required. This information was also requested from the DSL providers in other jurisdictions, but Qwest has not received this data either. As indicated by the requests for information, Qwest would prefer to have the CLECs' projections to use as inputs for estimating the rate for recovery of the OSS costs. Without alternative data, Qwest used the best information available to estimate demand, including an amount for potential churn. Projections were made of the number of lines to be shared for the first two years and trends were developed from this information for five years. Qwest is willing to consider alternative inputs if the CLECs have information that they would be willing to provide.

IX. COLLOCATION

Q. WHY IS IT APPROPRIATE FOR QWEST TO FILE ITS COLLOCATION STUDY IN THIS PHASE OF THE PROCEEDING?

A. Qwest is filing a Collocation study in this phase for two reasons. First, the FCC has issued its Advanced Services Order strengthening the collocation rules and addressing new requirements for collocation.[40] Similar to the UNE Remand Order, Qwest is faced with new collocation elements and new configurations of existing elements. As a result, Qwest now offers cageless collocation as an option, as well as a standard design and price for both caged and cageless collocation. The standard price includes common designs for elements such as cable racking, power, or number of bays. However, the new approach also allows CLECs the flexibility to make specific changes that "customize" the collocation to fit their needs, again at pre-determined prices, thus eliminating the requirement for Individual Case Basis (ICB) pricing.

Second, Qwest is also filing its Line Sharing study in this phase of the docket. The Commission in its Procedural Order, issued August 21, 2000, stated that issues associated with line sharing should be addressed. The Line Sharing cost study is primarily focused on the collocation elements associated with provisioning the line sharing capability at the central office, including splitter equipment described in Mr. Overton's testimony. Since the line sharing collocation elements are based on Qwest's latest Collocation cost study, it makes sense to address those elements concurrently.

Q. WHAT COST DATA IS PROVIDED IN THE COLLOCATION MODEL?

[40] *In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability,* CC Docket No. 98-147, Third Report and Order (Rel. March 31, 1999) ("Advanced Services Order").

A. The Collocation Model provides cost data for caged, cageless and virtual collocation, and includes TELRIC data for the following collocation elements:

Standard Collocation:

- Terminations
- Collocation Entrance Facility
- Cable Splicing
- Power Usage
- Security
- Interconnection Tie Pairs (ITPs)

Cageless Collocation:

- Space Construction
- DC Power Cable
- Space Rent
- Quote Preparation Fee (QPF)

Caged Collocation:

- Space Construction
- DC Power Cable
- Grounding
- Space Rent
- Quote Preparation Fee (QPF)

Virtual Collocation:

- Equipment Bay
- Labor
- Quote Preparation Fee (QPF)

The Collocation Model summary of results is included as Exhibit TKM-06 of my testimony. Please refer to the testimony of Mr. Robert Kennedy for a description of these collocation elements.

Q. HAVE YOU PROVIDED SCHEMATIC DIAGRAMS THAT DEPICT THE VARIOUS COLLOCATION ELEMENTS?

A. Yes. Exhibit TKM-06A contains several schematic diagrams that depict the collocation cost elements. Page 1 of this exhibit provides a diagram that shows the overall collocation configuration, while pages 3 through 6 provide more detailed diagrams for power plant, entrance facility, space construction and terminations.

Q. DOES THE COLLOCATION MODEL CALCULATE RECURRING AND NONRECURRING COSTS?

A. Yes. The Collocation Model calculates the forward-looking recurring and nonrecurring incremental costs for the collocation elements listed above. The nonrecurring costs include the cost of installing equipment on the CLEC side of the demarcation point. This equipment is dedicated to CLECs and is not shared with Qwest. The nonrecurring cost elements include: Terminations, the Entrance Facility, Fiber Cable Splicing, Backup AC Power Cable, Space Construction (including DC power cables), Construction of Additional Bays (Cageless) and Grounding (Caged).

Recurring elements include the small ongoing costs associated with maintaining the collocation equipment that is dedicated to CLECs (e.g., Terminations, Power Cables, Space Construction), along with the investment-related costs associated with equipment that is shared between CLECs and Qwest. Recurring elements also include: DC Power Plant, AC Power Feed Usage, Security Cards, Central Office Synchronization, Interconnection Tie Pair (ITP), Space Rent, Grounding (Caged), and Equipment Bay (Virtual).

Q. IS THE TREATMENT OF RECURRING AND NONRECURRING COSTS IN THE COLLOCATION MODEL CONSISTENT WITH THE FCC'S COLLOCATION PRINCIPLES?

A. Yes. In its Second Report and Order in CC Docket No. 93-162, regarding pricing for collocation, the FCC set out principles for determining whether a cost should be recovered through a nonrecurring charge. In Paragraph 32 of that order the FCC states:

> While carriers typically recover investment costs through recurring charges, we find that it is not unreasonable for LECs to assess nonrecurring charges to recover the cost of equipment. Inasmuch as physical collocation is a new service, LECs may have difficulty projecting either the length of time that equipment will be used by an interconnector or the useful life of that equipment for depreciation purposes. When a LEC imposes a recurring charge to recover the depreciation of an asset over time, overestimating the life of the equipment or the length of time that an interconnector would use the equipment could prevent the LEC from recovering the total cost of its

> investment. We will not, however, permit LECs to recover initially an amount greater than the total installed cost of the equipment, plus a reasonable overhead loading.

The FCC went on to say in paragraph 33:

> We do not agree with ALTS' position that nonrecurring charges developed in conformance with these requirements constitute a barrier to entry. To the extent that the equipment needed for expanded interconnection service is dedicated to a particular interconnector, we believe that requiring that interconnector to pay the full cost of the equipment up front is reasonable because LECs should not be forced to underwrite the risk of investing in equipment dedicated to the interconnectors use, regardless of whether the equipment is reusable....

It is clear from these ordering paragraphs that the FCC recognizes that LECs should not be held accountable for underwriting all the risk of building an interconnector's network. The FCC established the costing principle that the cost of facilities constructed solely for the provisioning of collocation (i.e. dedicated to collocation) can be recovered through nonrecurring, up-front charges. In fact, the order goes so far as to imply anything else would result in an unreasonable transfer of the risk of constructing a CLEC network to the ILEC that is providing collocation. The 1996 Telecommunications Act was designed to give competitors access to critical network elements that were currently owned by the ILECs. This access to elements was considered critical to meeting the competitive objectives of the Act. Nowhere in the Act did Congress decide that it was also the ILEC responsibility to finance a co-provider's entry into the market. Such a requirement would be unreasonable and discriminatory.

Q. PLEASE EXPLAIN HOW THE DIRECT COLLOCATION COSTS ARE DEVELOPED IN THE COLLOCATION MODEL.

A. The direct costs for the bulk of the collocation cost elements are calculated based on inputs derived from an analysis of the cost of *actual collocation jobs* in Qwest central offices. In this analysis, Qwest analyzed every item that was purchased and installed for a sample of collocation jobs. The invoices were analyzed through a multi-step process as follows:

1. Each item of material that was billed to each job was entered into a database;

2. Each item of material was classified into cost categories that represent the various components of collocation (i.e. cable racking, power cable, support structure, etc.);

3. The costs for placing each component of a collocation job were calculated using standard contract labor costs along with the number of units being placed on each job, as determined from the invoices;

4. The calculated labor costs were compared to the actual invoiced labor charges to determine that they were reasonable;

5. The labor costs were added to the material costs to determine the total cost for each component of the job;

6. The cost for each component was assigned to each of the appropriate collocation rate elements;

7. The collocation rate element were designated as being recoverable through a one-time nonrecurring charge or a monthly recurring charge, based on the criteria discussed above;

8. Nonrecurring cost elements that are shared among collocators were prorated based on the anticipated number of CLECs that would participate in the use of those facilities;

9. The results of the analysis were used as inputs to the Collocation Model to develop the direct costs associated with each collocation element.

Q. WHAT TYPES OF COLLOCATION JOBS WERE INCLUDED IN THE SAMPLE?

A. The sample included only cageless collocation jobs. Once the analysis of cageless costs was completed, the assumptions were revised and the missing elements were added to derive a standard cost for a *caged* collocation job. Wherever possible, actual caged collocation data was used in revising the assumptions or estimating the cost for those components of a caged collocation job (e.g., the cost of the cage) which are not found in cageless collocation jobs.

Q. HOW DID QWEST TAKE INTO ACCOUNT THE COST DIFFERENCES BETWEEN CAGELESS AND CAGED COLLOCATION?

A. A team of experts with experience in the development, construction and cost analysis of collocation activities reviewed the assumptions used in the cageless cost study and agreed upon revisions to distances and other inputs that would more appropriately reflect a standard caged collocation environment. In addition, items such as the cost of the cage and grounding were included in the caged collocation cost study.

Q. HOW DID QWEST IDENTIFY THE JOBS THAT WERE TO BE INCLUDED IN THE COLLOCATION ANALYSIS?

A. Qwest analyzed all cageless collocation jobs that were constructed prior to May of 1999. In total, 96 jobs were originally identified as meeting these criteria. Nineteen of the jobs identified were augments of existing jobs and were eliminated from the sample. All the receipts for the remaining 77 collocation jobs were then collected. In certain instances, there is a significant lag between the completion of the job and the receipt of the vendor billing for that job. To determine if the company had received the contractor billing for all the work performed on a specific job, the receipts for each job were compared to the authorized purchase orders for those jobs. If this comparison showed that the billing for virtually all the contracted construction had been received, the job was retained in the sample. Jobs with greater than 10% of the total billing still outstanding were removed from the sample. Of the 77 jobs, the billing on 41 jobs was sufficiently complete to use in the analysis.

Q. IN THE FIRST STEP IDENTIFIED ABOVE, YOU NOTED THAT MATERIAL ITEMS WERE ENTERED INTO A DATABASE. WHAT DATA DID THE COMPANY ENTER INTO THE DATABASE?

A. For each job, the database contains the type of material purchased, the quantity purchased, the purchase price and the standard contracted labor rates for placing the facility. In Step 2, each item or group of items was then categorized into groups that represent the various components of a collocation installation. For example, all the material items, such as cable, fuses, and lugs used to connect various sizes of power cable were grouped into the Power Plant category. Similarly, cable racking, cable horns and the components used to connect the racking were placed in a Cable Racking category.

Q. IN STEP 3, WHY DID YOU USE STANDARD CONTRACTED LABOR COSTS AS OPPOSED TO USING THE ACTUAL LABOR THAT WAS BOOKED TO THE JOB?

A. The invoices for labor costs did not contain an itemized list of all the functions that were performed by the contractors. Virtually all the bills only listed the total hours spent on the job along with the total cost for all functions performed. To determine costs for an average collocation job, these labor costs needed to be identified with the same cost components as the material costs. To accomplish this, the study multiplied the standard contract labor rate for each function times the unit volumes obtained from the material receipts to develop costs by category. In Step 4, the total of these costs were then compared to the actual labor receipts to ensure that the calculations produced reasonable results. Also, in Step 4, the labor costs were added to the material costs to determine the total cost for each component of the job.

Q. HOW DO THE COLLOCATION CALCULATIONS ALLOW FOR DIFFERENCES BETWEEN THE COSTS FOR VARIOUS COLLOCATION DESIGNS?

A. Qwest gives collocators many options. For example, a collocator may order several types of terminations, and may order several different sizes of DC power cable based on its specific power needs. To account for these variations in the requested facilities, Qwest developed standard costs for terminations and power feeds. These standard costs were modeled based on the characteristics (i.e. material and labor costs and unit quantities and standard distances and designs) found in the 41 jobs that were studied. These standard designs were then adjusted to account for any incremental cost or savings that would be incurred if the design was altered.

Q. ONCE COSTS FOR COST COMPONENTS WERE IDENTIFIED, WHAT WAS THE NEXT STEP IN THE COST DEVELOPMENT PROCESS?

A. The next step (Step 6) in the cost analysis assigned the individual cost components to collocation rate elements, as listed above and as described in the testimony of Mr. Kennedy. In some cases, several cost components (e.g. cable racking, support structure, etc) are recovered through a single collocation element (e.g. Space construction).

Q. ARE THE COSTS FOR THESE JOBS ASSIGNED TO BOTH RECURRING AND NONRECURRING COST CATEGORIES?

A. Yes. As I noted earlier, the study develops nonrecurring costs that include the cost of equipment that is dedicated to CLECs, and recurring costs that include the cost of equipment that is shared between CLECs and Qwest. In Step 7, the costs of the collocation jobs were assigned to the nonrecurring and recurring categories.

Once the nonrecurring cost of equipment that is dedicated to CLECs was identified, the next step in the cost study process (Step 8) was to identify those nonrecurring components of a standard collocation that would be used by more than one collocator. Several components of a standard collocation were determined to fall into this category including (but not limited to) lighting, cable racking, aerial support structure and heating, ventilation and air conditioning (HVAC). The costs for these elements of collocation were prorated over the number of collocators that were anticipated to use the facilities.

At this point in the process, all the costs have been assigned to specific collocation components such as cable racking, power cable, support structure and terminations. The costs have also been identified as being recoverable through recurring or nonrecurring charges.

Q. DOES QWEST'S COLLOCATION COST STUDY COMPLY WITH RECENT FCC ORDERS REGARDING COLLOCATION?

A. Yes. The Qwest's collocation study complies with FCC Order CC Docket No. 98-147 which is sometimes referred to as the Advanced Services Order and sometimes the "706" rules. This order primarily approaches collocation from a perspective of determining what collocation elements need to be offered and under what terms and conditions they should be offered, rather than from a cost perspective. However, the FCC does provide some direction regarding cost methodology for site preparation. The FCC states:

> "For example, if an incumbent LEC implements cageless collocation arrangements in a particular central office that requires air conditioning and power upgrades, the incumbent may not require the first collocating party to pay the entire cost of site preparation."[41]

Qwest's cost studies assume an average of 3 cage collocators and 3 cageless collocators in each central office. This assumption means that those costs related to construction are divided by 3 in cases where a facility (e.g., a cable rack) is used only by cage collocating CLECs. Where facilities are assumed to be shared by CLECs and Qwest, the costs are assumed to be limited to only

[41] Advanced Services Order at ¶ 51.

recurring charges, and are determined on a shared basis with all users. This cost methodology is consistent with the FCC's direction in its 706 rules.

X. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. Qwest has a right under the Act to seek recovery for the UNEs that it is required to provide to the CLECs. Qwest's TELRIC studies properly apply the FCC's TELRIC principles. For the UNEs and interconnection services included in this Phase of the docket, I have submitted recurring and nonrecurring TELRIC cost studies. The Commission should set prices for unbundled network elements based on the TELRIC data summarized in the TELRIC Cost Summary Exhibits to my testimony.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS.	]]]]]]	**DOCKET NO. T-00000A-00-0194 PHASE II**

EXHIBITS OF

TERESA K. MILLION

MARCH 15, 2001

INDEX OF EXHIBITS

The following Exhibits are provided in CD format:

TKM-01	Summary of Recurring and Nonrecurring Costs
TKM-02	Integrated Cost Model (ICM)
TKM-03	Enhanced Nonrecurring Cost Study (ENRC)
TKM-04	Line Sharing - Collocation
TKM-05	Line Sharing - OSS
TKM-06	Collocation
TKM-06A**	Collocation Diagrams
TKM-07	DS1/DS3 Capable Loops, DS1 Capable Feeder, Dark Fiber
TKM-08	Subloop Distribution, Building Cable
TKM-09	Vertical Features
TKM-10	LIS-EICT
TKM-11	Channel Regeneration
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TKM-17	Unbundled Calling Name Service (UCNAM)
TKM-18	Category 11 Records
TKM-19	CLASS Call Trace

** Attached to Testimony, Not on CD

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
6.2	**CUSTOMER TRANSFER CHARGE (CTC)**				
6.2.1	Customer Transfer Charge POTS First Mechanized			$0.68	4591
	Customer Transfer Charge POTS Each Addl Mechanized			$0.14	4591
6.2.2	Customer Transfer Charge POTS First Manual			$16.21	4591
	Customer Transfer Charge POTS each addl Manual			$2.70	4591
6.2.3	CTC for Private Line Transport Services				
	Customer Transfer Charge Private Line First			$40.87	4591
	Customer Transfer Charge Private Line Each Addl			$40.87	4591
6.2.4	Customer Transfer Charge Advanced Communication Service Per CKT			$51.34	4591
7.0	**INTERCONNECTION**				
7.1	Entrance Facilities/EUDIT with Customer Location Electronics				
7.1.1	DS1 Entrance Facility		$92.18	$218.84	4679/4591
7.1.2	DS3 Entrance Facility		$486.15	$414.26	4679/4591
7.2	**LIS EICT**				
7.2.1	DS1 EICT		$10.24	$161.70	4701/4591
7.3	Interconnection Tie Pair (ITP) (Optional)		$1.58		4694
7.4	Regeneration (Optional)		$9.45	$480.05	4703
7.2.2	DS3 EICT		$47.99	$357.12	4701/4591
	Interconnection Tie Pair (ITP) (Optional)		$15.92		4694
	Regeneration (Optional)		$34.16	$1,807.55	4703

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
7.5	**DIRECT TRUNK TRANSPORT**				
7.5.1	DS1 Over 0 to 8 Miles	$33.05	$1.56		4679
	DS1 Over 8 to 25 Miles	$33.33	$1.26		4679
	DS1 Over 25 to 50 Miles	$33.81	$2.28		4679
	DS1 Over 50 Miles	$33.78	$1.19		4679
7.5.2	DS3 Over 0 to 8 Miles	$210.28	$65.55		4679
	DS3 Over 8 to 25 Miles	$213.45	$20.30		4679
	DS3 Over 25 to 50 Miles	$196.74	$25.43		4679
	DS3 Over 50 Miles	$207.61	$17.49		4679
7.6	**MULTIPLEXING**				
	Multiplexing DS3 to DS1		$246.64	$267.45	4679/4591
7.7	**TRUNK NONRECURRING CHARGES**				
7.7.1	DS1 Interface, First Trunk			$353.67	4591
	DS1 Interface, Each Additional Trunk			$5.90	4591
7.7.2	DS3 Interface, First Trunk			$360.45	4591
	DS3 Interface, Each Additional Trunk			$12.69	4591
7.8	**LOCAL TRAFFIC**				
7.8.1	End office call termination, per minute of use		$0.002207		4679
7.8.2	**Tandem Switched Transport**				
7.8.2.1	Tandem Switching, per Minute of Use		$0.001653		4679
7.8.2.2	Tandem Transmission, per Minute of Use				
	0 to 8 miles	$0.000485	$0.0000454		4679
	8 to 25 miles	$0.000494	$0.0000227		4679
	25 to 50 miles	$0.000477	$0.0000117		4679
	Over 50 miles	$0.000461	$0.0000042		4679

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
7.11.4	Category 11 Mechanized Record Charge, per Record		$0.001819		4671
8.0	**COLLOCATION**				
8.1.1	Collocation Entrance Facility, Per Fiber				
8.1.1	Standard Shared per Fiber		$15.17	$1,232.89	4694
8.1.1	Cross Connect per Fiber		$22.75	$1,658.09	4694
8.1.1	Express per Cable		$240.26	$8,783.09	4694
8.1.2	**Cable Splicing**				
8.1.2	Fiber Per Set Up			$474.74	4694
8.1.2	Per fiber Spliced			$37.95	4694
8.1.3	**Power Usage**				
8.1.3	Power Plant per Amp Ordered		$11.36		4694
8.1.3	Power Usage-Less than 60 AMPS per Amp Ordered		$3.69		4694
8.1.3	Power Usage-More than 60 AMPS per Amp Ordered		$7.37		4694
8.1.4	**Backup AC Power Feed Usage**				
8.1.4.1	120 V per Amp per Month		$19.26		4694
8.1.4.1	208 V, Single Phase per Amp per Month		$33.38		4694
8.1.4.1	208 V, Three Phase per Amp per Month		$57.75		4694
8.1.4.1	240 V, Single Phase per Amp per Month		$38.52		4694
8.1.4.1	240 V, Three Phase per Amp per Month		$66.64		4694
8.1.4.1	480 V, Three Phase per Amp per Month		$133.28		4694
8.1.4.2	**Backup AC Power Cable - Per Foot, per Month**				
8.1.4.2	20 Amp, Single Phase per Foot		$0.0146	$7.98	4694
8.1.4.2	20 Amp, Three Phase per Foot		$0.0181	$9.90	4694
8.1.4.2	30 Amp, Single Phase per Foot		$0.0157	$8.61	4694
8.1.4.2	30 Amp, Three Phase per Foot		$0.0216	$11.82	4694
8.1.4.2	40 Amp, Single Phase per Foot		$0.0185	$10.12	4694
8.1.4.2	40 Amp, Three Phase per Foot		$0.0254	$13.93	4694

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
8.1.4.2	50 Amp, Single Phase per Foot		$0.0219	$12.01	4694
8.1.4.2	50 Amp, Three Phase per Foot		$0.0306	$16.76	4694
8.1.4.2	60 Amp, Single Phase per Foot		$0.0248	$13.58	4694
8.1.4.2	60 Amp, Three Phase per Foot		$0.0352	$19.29	4694
8.1.4.2	100 Amp, Single Phase per Foot		$0.0307	$16.81	4694
8.1.4.2	100 Amp, Three Phase per Foot		$0.0479	$26.24	4694
8.1.5	Inspector - Regular Business Hours Per 1/2 Hour			$31.18	4694
8.1.5	Inspector - Outside Regular Business Hours Per 1/2 Hour			$38.96	4694
8.1.8	***COLLOCATION TERMINATIONS***				
8.1.8.1	DS0 Cable Placement per 100 Pair Block or,		$0.5701	$243.35	4694
8.1.8.1	DS0 Cable Placement per Termination		$0.0107	$4.57	4694
8.1.8.1	DS0 Cable per 100 Pair Block or,		$0.7333	$313.03	4694
8.1.8.1	DS0 Cable per Termination		$0.0100	$4.29	4694
8.1.8.1	DS0 Blocks per 100 Pair Block or,		$1.2786	$545.80	4694
8.1.8.1	DS0 Blocks per Termination		$0.0175	$7.48	4694
8.1.8.1	DS0 Block Placement per 100 Pair Block or,		$0.5913	$252.40	4694
8.1.8.1	DS0 Block Placement per Termination		$0.0081	$3.46	4694
8.1.8.2	DS1 Cable Placement per block (28 DS1s) or,		$0.7386	$404.75	4694
8.1.8.2	DS1 Cable Placement per Termination		$0.0794	$43.52	4694
8.1.8.2	DS1 Cable per block (28 DS1s) or,		$0.6594	$361.38	4694
8.1.8.2	DS1 Cable per per Termination		$0.0709	$38.86	4694
8.1.8.2	DS1 Panel per block (28 DS1s) or,		$0.7525	$412.36	4694
8.1.8.2	DS1 Panel per Termination		$0.0908	$49.78	4694
8.1.8.2	DS1 Panel Placement per block (28 DS1s) or,		$0.1576	$86.36	4694
8.1.8.2	DS1 Panel Placement per Termination		$0.0169	$9.29	4694
8.1.8.3	DS3 Cable Placement per Termination		$0.3007	$164.79	4694
8.1.8.3	DS3 Cable per Termination		$0.4258	$233.36	4694
8.1.8.3	DS3 Panel/Connector per Termination		$0.4388	$240.45	4694
8.1.8.3	DS3 Panel/Connector Placement per Termination		$0.0453	$24.81	4694

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
8.1.9	**SECURITY**				
8.1.7	Access Card per Employee		$0.87		4694
	Card Access Per Person per Office per Month		$8.07		4694
8.1.10	C O Clock Synchronization per Port		$7.70		4694
8.3	**CAGELESS COLLOCATION**				
8.3.1	Quotation Preparation Fee			$4,380.68	4694
8.3.2	Space Construction for 2 Bays and 1 - 40A Power Feed		$54.42	$29,823.10	4694
8.3.2	Space Construction Adjustment for 20A Initial Power Feed		-$3.97	-$2,177.62	4694
8.3.2	Space Construction Adjustment for 30A Initial Power Feed		-$2.54	-$1,389.75	4694
8.3.2	Space Construction Adjustment for 60A Initial Power Feed		$3.48	$1,907.82	4694
8.2.2	Space Construction Adjustment for Each Additional Bay		$5.52	$3,024.83	4694
8.2.2	Space Construction Adjustment for Each Additional 20A Power Feed		$10.09	$5,528.47	4694
8.2.2	Space Construction Adjustment for Each Additional 30A Power Feed		$11.53	$6,316.35	4694
8.2.2	Space Construction Adjustment for Each Additional 40A Power Feed		$14.06	$7,706.09	4694
8.2.2	Space Construction Adjustment for Each Additional 60A Power Feed		$17.54	$9,613.92	4694
8.3.3	Floor Space Lease, Per Sq. Ft.		$3.96		

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
8.4	**CAGED COLLOCATION**				
8.4.1	Quotation Preparation Fee - Caged Construction			$4,763.06	4694
8.4.1	Cage-Up to 100 Sq Ft		$94.30	$51,675.14	4694
8.4.1	Cage-101 Sq Ft to 200 Sq Ft		$97.85	$53,623.79	4694
8.4.1	Cage-201 Sq Ft to 300 Sq Ft		$100.62	$55,139.10	4694
8.4.1	Cage-301 Sq Ft to 400 Sq Ft		$104.08	$57,038.08	4694
8.4.2	Space Construction Adjustment for 20A Initial Power Feed		-$15.41	-$8,444.49	4694
8.4.2	Space Construction Adjustment for 30A Initial Power Feed		-$14.03	-$7,687.98	4694
8.4.2	Space Construction Adjustment for 40A Initial Power Feed		-$11.14	-$6,106.39	4694
8.4.2	Space Construction Adjustment for 100A Initial Power Feed		$17.06	$9,348.19	4694
8.4.2	Space Construction Adjustment for 200A Initial Power Feed		$54.46	$29,843.97	4694
8.4.2	Space Construction Adjustment for 300A Initial Power Feed		$99.92	$54,756.39	4694
8.4.2	Space Construction Adjustment for 400A Initial Power Feed		$153.68	$84,219.54	4694
8.4.2	Space Construction Adjustment for Each Additional 20A Power Feed		$12.73	$6,973.86	4694
8.4.2	Space Construction Adjustment for Each Additional 30A Power Feed		$14.11	$7,730.36	4694
8.4.2	Space Construction Adjustment for Each Additional 40A Power Feed		$16.99	$9,311.95	4694
8.4.2	Space Construction Adjustment for Each Additional 60A Power Feed		$28.14	$15,418.34	4694
8.4.2	Space Construction Adjustment for Each Additional 100A Power Feed		$45.19	$24,766.54	4694
8.4.2	Space Construction Adjustment for Each Additional 200A Power Feed		$82.59	$45,262.31	4694
8.4.2	Space Construction Adjustment for Each Additional 300A Power Feed		$128.05	$70,174.74	4694
8.4.2	Space Construction Adjustment for Each Additional 400A Power Feed		$181.82	$99,637.89	4694

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
8.4.3	Rent per Square Foot		$3.96		4694
8.4.4	Grounding				
8.4.4	#2 AWG per Foot		$0.0230	$12.59	4694
8.4.4	1/0 AWG per Foot		$0.0382	$20.96	4694
8.4.4	4/0 AWG per Foot		$0.0435	$23.81	4694
8.4.4	350 KCMIL per Foot		$0.0603	$33.04	4694
8.4.4	500 KCMIL per Foot		$0.0672	$36.81	4694
8.4.4	750 KCMIL per Foot		$0.1029	$56.40	4694
8.2	**VIRTUAL COLLOCATION**				
8.2.1	Quotation Preparation Fee - Virtual			$4,380.68	4694
8.2.2	Maintenance - Regular Business Hours Per 1/2 Hour			$27.97	4694
8.2.2	Maintenance - Outside Regular Business Hours Per 1/2 Hour			$37.43	4694
8.2.3	Training - Regular Business Hours Per 1/2 Hour			$27.97	4694
8.2.4	Equipment Bay per Shelf		$3.75		4694
8.2.5	Engineering - Regular Business Hours Per 1/2 Hour			$30.18	4694
8.2.5	Engineering - Outside Regular Business Hours Per 1/2 Hour			$38.96	4694
8.2.6	Installation - Regular Business Hours Per 1/2 Hour			$31.89	4694
8.2.6	Installation - Outside Regular Business Hours Per 1/2 Hour			$41.07	4694
8.2.7	Rent per Square Foot		$3.96		4694

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
8.8	**CLEC TO CLEC CONNECTIONS**				
8.8.1	Flat Charge (Design Engineering & Installation - NO CABLES.)			$1,353.22	4704
8.8.2	Cable Racking (per foot), DS0		$0.17316		4704
8.8.2	Cable Racking (per foot), DS1		$0.18388		4704
8.8.2	Cable Racking (per foot), DS3		$0.15906		4704
V	Virtual Connections (NO CABLES) DS0 (per 100 Connections)			$223.03	4704
8.5.3	Virtual Connections (NO CABLES) DS1 (per 28 Connections)			$101.73	4704
8.5.3	Virtual Connections (NO CABLES) DS3 (per 1 Connection)			$8.80	4704
8.8.4	Cable Hole (if applicable)			$425.99	4704
8.8.5	**CLEC TO CLEC CROSS CONNECTION**			$255.25	45.91
9.0	**Unbundled Network Elements (UNEs)**				
9.1	**Interconnection Tie Pairs (ITP) – Per Termination**				
	DS0 Per Connection		$0.51		4704
	DS1 Per Connection		$1.58		4704
	DS3 Per Connection		$15.92		4704
9.2	**UNBUNDLED LOOPS**				
9.2.1	Analog Loops				
9.2.1	Unbundled Loop (2 Wire) Statewide Average		$28.96		
	Unbundled Loop (2 Wire) Zone 1		$23.07		4679
	Unbundled Loop (2 Wire) Zone 2		$28.64		4679
	Unbundled Loop (2 Wire) Zone 3		$42.14		4679
	Unbundled Loop (4 Wire) Statewide Average		$58.41		
	Unbundled Loop (4 Wire) Zone 1		$46.63		4679
	Unbundled Loop (4 Wire) Zone 2		$57.76		4679
	Unbundled Loop (4 Wire) Zone 3		$84.76		4679

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.2.2	**Non-loaded Loops**		Same as 9.2.1		
9.2.3	CABLE UNLOADING/BRIDGE TAP REMOVAL			$649.98	4591
9.2.4	**Digital Capable Loops**				
9.2.4.1	Basic Rate ISDN Capable Loop/xDSL/ADSL		Same as 9.2.1		
9.2.4.2	DS1 Capable Loop Zone 1		$89.89		4700
9.2.4.2	DS1 Capable Loop Zone 2		$90.46		4700
9.2.4.2	DS1 Capable Loop Zone 3		$100.30		4700
9.2.4.2	DS1 Capable Loop State Avg.		$92.18		4700
9.2.4.3	DS3 Capable Loop Zone 1		$954.79		4700
9.2.4.3	DS3 Capable Loop Zone 2		$967.83		4700
9.2.4.3	DS3 Capable Loop Zone 3		$1,189.60		4700
9.2.4.3	DS3 Capable Loop State Avg.		$1,006.64		4700
9.2.5	2-Wire Extension Technology		$5.93		4679
9.2.6	DSO Loop Installation Charges	Same as 9.2.1 – 9.2.3			
	LOOP BASIC INSTALLATION FIRST			$87.91	4591
	LOOP BASIC INSTALLATION EA ADDL			$75.74	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	LOOP BASIC INSTALL WITH PERFORMANCE TESTING FIRST			$191.45	4591
	LOOP BASIC INSTALL WITH PERFORMANCE TESTING EA ADD'L			$137.36	4591
	LOOP COORD INSTALL, COOP TESTING FIRST			$231.24	4591
	LOOP COORD INSTALL, COOP TESTING EA ADDL			$137.36	4591
	LOOP COORD INSTALL, W/O TESTING FIRST			$94.96	4591
	LOOP COORD INSTALL, W/O TESTING EA ADDL			$82.79	4591
	LOOP BASIC INSTALL COOP TESTING FIRST			$191.45	4591
	LOOP BASIC INSTALL COOP TESTING EA ADDL			$137.36	4591
9.2.7	**DS1 Loop Installation**				
	DS1 CAPABLE LOOP BASIC INSTALL FIRST			$143.52	4591
	DS1 CAPABLE LOOP BASIC INSTALL EA ADDL			$110.31	4591
	DS1 CAPABLE LOOP BASIC INSTALL PERFORMANCE TEST FIRST			$276.96	4591
	DS1 CAPABLE LOOP PERFORMANCE TEST EA ADDL			$202.83	4591
	DS1 CAPABLE LOOP COORD INSTALL WITH COOPERATIVE TEST FIRST			$316.75	4591
	DS1 CAPABLE LOOP COORD INSTALL WITH COOPERATIVE TEST EA ADDL			$202.83	4591
	DS1 CAPABLE LOOP COORD INSTALL W/O TEST FIRST			$152.59	4591
	DS1 CAPABLE LOOP COORD INSTALL W/O TEST EA ADDL			$119.37	4591
	DS1 CAPABLE LOOP BASIC INSTALL WITH COOPERATIVE TEST FIRST			$276.96	4591
	DS1 CAPABLE LOOP BASIC INSTALL WITH COOPERATIVE TEST EA ADDL			$202.83	4591
9.2.8	**DS3 LOOP INSTALLATION**				

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	DS3 CAPABLE LOOP BASIC INSTALL FIRST			$143.52	4591
	DS3 CAPABLE LOOP BASIC INSTALL EA ADDL			$110.31	4591
	DS3 CAPABLE LOOP BASIC INSTALL PERFORMANCE TEST FIRST			$276.96	4591
	DS3 CAPABLE LOOP PERFORMANCE TEST EA ADDL			$202.83	4591
	DS3 CAPABLE LOOP COORD INSTALL WITH COOPERATIVE TEST FIRST			$316.75	4591
	DS3 CAPABLE LOOP COORD INSTALL WITH COOPERATIVE TEST EA ADDL			$202.83	4591
	DS3 CAPABLE LOOP COORD INSTALL W/O TEST FIRST			$152.59	4591
	DS3 CAPABLE LOOP COORD INSTALL W/O TEST EA ADDL			$119.37	4591
	DS3 CAPABLE LOOP BASIC INSTALL WITH COOPERATIVE TEST FIRST			$276.96	4591
	DS3 CAPABLE LOOP BASIC INSTALL WITH COOPERATIVE TEST EA ADDL			$202.83	4591
9.3	**SUB-LOOP**				
9.3.1	Distribution - Average		$22.24		4677
9.3.1	Distribution - ZONE 1 First		$15.85	$120.90	4677/4591
	Distribution - ZONE 1 Ea. Add'l			$55.26	4677/4591
9.3.1	Distribution - ZONE 2 First		$21.57	$120.90	4677/4591
	Distribution - ZONE 2 Ea. Add'l			$55.26	4677/4591
9.3.1	Distribution - ZONE 3 First		$35.23	$120.90	4677/4591
	Distribution - ZONE 3 Ea. Add'l			$55.26	4677/4591
9.3.1	2-Wire Non Loaded		Same as 9.3.1		
9.3.2	Building Cable - Per Pair		$1.24		4677
9.3.1	4-Wire Analog Distribution Loop				
9.3.1	4-Wire Non-Loaded Loop				
9.3.1	Unbundled Distribution Sub-Loop First			$120.90	4591
9.3.1	Unbundled Distribution Sub-Loop Each Add'l			$55.26	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.3.3	DS1 Capable Feeder Loop Zone1		$77.43		4700
	DS1 Capable Feeder Loop Zone2		$78.01		4700
	DS1 Capable Feeder Loop Zone3		$87.85		4700
	DS1 Capable Feeder Loop State Avg.		$79.72		4700
	DS1 Feeder Sub-Loop First			$292.08	4591
	DS1 Feeder Sub-Loop Each Add'l			$218.54	4591
9.3.4	Field Connection Point Quotation Preparation Fee			$1,631.67	4591
9.4	**LINE SHARING**				
9.4.1	Shared Loop (per loop per order)		$5.00	$37.54	4591
9.4.2	OSS Per Line Per Month		$2.74		
9.4.6	Splitter Shelf Charge		$6.63	$531.91	4702
9.4.4.1	Splitter in the Common Area - Data to 410 Block		$8.57	$3,175.97	4702
9.4.4.1	Splitter in the Common Area - Data Direct to CLEC		$8.99	$3,333.21	4702
9.4.4.3	Splitter on the MDF - Data to 410 Block		$2.81	$1,039.82	4702
9.4.4.3	Splitter on the MDF - Data Direct to CLEC		$6.03	$2,233.08	4702
9.4.4.2	Splitter on the IDF - Data to 410 Block		$2.73	$1,010.84	4702
9.4.4.2	Splitter on the IDF - Data Direct to CLEC		$5.11	$1,892.62	4702
9.4.8	Engineering			$1,274.63	4702
9.5	**Network Interface Device (2 Wire) Statewide Average/Network Interface Device**				
9.5	NID		$1.44	$68.49	4679/4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.6	UDIT				
9.6.1	UDIT DSO			$306.61	4591
	Over 0 to 8 Miles, Fixed & Over 0 to 8 Miles, Per Air Mile	$20.93	$0.14		4679
	Over 8 to 25 Miles, Fixed & Over 8 to 25 Miles, Per Air Mile	$20.95	$0.12		4679
	Over 25 to 50 Miles, Fixed & Over 25 to 50 Miles, Per Air Mile	$20.99	$0.13		4679
	Over 50 Miles, Fixed & Over 50 Miles, Per Air Mile	$20.94	$0.06		4679
9.6.2	UDIT DS1			$351.39	4591
	Over 0 to 8 Miles, Fixed & Over 0 to 8 Miles, Per Air Mile	$33.05	$1.56		4679
	Over 8 to 25 Miles, Fixed & Over 8 to 25 Miles, Per Air Mile	$33.33	$1.26		4679
	Over 25 to 50 Miles, Fixed & Over 25 to 50 Miles, Per Air Mile	$33.81	$2.28		4679
	Over 50 Miles, Fixed & Over 50 Miles, Per Air Mile	$33.78	$1.19		4679
9.6.3	UDIT DS3			$351.39	4591
	Over 0 to 8 Miles, Fixed & Over 0 to 8 Miles, Per Air Mile	$210.28	$65.55		4679
	Over 8 to 25 Miles, Fixed & Over 8 to 25 Miles, Per Air Mile	$213.45	$20.30		4679
	Over 25 to 50 Miles, Fixed & Over 25 to 50 Miles, Per Air Mile	$196.74	$25.43		4679
	Over 50 Miles, Fixed & Over 50 Miles, Per Air Mile	$207.61	$17.49		4679
9.6.4	UDIT OC3			$351.39	4591
	Over 0 to 8 Miles, Fixed & Over 0 to 8 Miles, Per Air Mile	$794.64	$252.46		4679
	Over 8 to 25 Miles, Fixed & Over 8 to 25 Miles, Per Air Mile	$801.21	$67.90		4679
	Over 25 to 50 Miles, Fixed & Over 25 to 50 Miles, Per Air Mile	$765.56	$92.37		4679
	Over 50 Miles, Fixed & Over 50 Miles, Per Air Mile	$788.37	$57.09		4679
9.6.5	UDIT OC12			$351.39	4591
	Over 0 to 8 Miles, Fixed & Over 0 to 8 Miles, Per Air Mile	$2,247.68	$87.64		4679
	Over 8 to 25 Miles, Fixed & Over 8 to 25 Miles, Per Air Mile	$2,247.68	$85.54		4679
	Over 25 to 50 Miles, Fixed & Over 25 to 50 Miles, Per Air Mile	$2,247.68	$98.38		4679
	Over 50 Miles, Fixed & Over 50 Miles, Per Air Mile	$2,247.68	$115.44		4679

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.6.8	Low Side Channel Performance		$13.90		4678
	Low Side Channel Performance with MULTIPLEXING		$8.87		4678
9.6.9	Multiplexing DS3 to DS1		$246.64	$267.45	4679
	Multiplexing DS1 to DS0		$229.32	$267.45	4679
9.6.9	UDIT M1-3 Multiplexing			$2,558.27	4591
9.6.9	UDIT M1-0 Multiplexing High side			$272.49	4591
9.6.9	UDIT M1-0 Multiplexing Low side			$238.79	4591
9.6.7	DS1 E-UDIT Without Customer Location Electronics		$59.13	$409.62	4679/4591
9.6.7	DS3 E-UDIT Without Customer Location Electronics		$335.36	$409.62	4679/4591
9.6.7	OC3 E-UDIT Without Customer Location Electronics		$734.07	$409.62	4679/4591
9.6.7	OC12 E-UDIT Without Customer Location Electronics		$1,377.93	$409.62	4679/4591
9.6.10	UDIT DS0 REARRANGEMENT DUAL OFFICE			$218.11	4591
9.6.10	UDIT DS0 REARRANGEMENT SINGLE OFFICE			$175.49	4591
9.6.10	UDIT HICAP REARRANGEMENT DUAL OFFICE			$264.86	4591
9.6.10	UDIT HICAP REARRANGEMENT SINGLE OFFICE			$237.35	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.7	**Unbundled Dark Fiber**				
9.7.2	DARK FIBER - INITIAL RECORDS INQUIRY CO TO CO OR CO TO CUST PREM			$158.80	4591
9.7.2	DARK FIBER - MID-SPAN SPLICE/STRUCTURE POINT INQUIRY (Complex)			$202.48	4591
9.7.3	DARK FIBER - FIELD VERIFICATION AND QUOTE PREPARATION			$1,478.86	4591
9.7.5	**UDF IOF**				
	Interoffice Dark Fiber - Per Route Mile		$88.52		
	2 Fiber Termination - Wire Center		$7.57		4700
	2 Fiber Cross Connect/Optical Cross Connect/Pair/Central Ofc.		$4.20	$21.46	4700/4591
9.7.6	**UDF Loop**				
	Unbundled Dark Fiber Loop - Per 2 Fiber Loop		$122.02		4700
	Dark fiber NRC Per Occurrence, Per route - First fiber Pair			$561.17	4591
	Dark fiber NRC Per Occurrence, Per route - Ea. Add'l Fiber Pair			$270.70	4591
	2 fiber Loop Termination - Wire Center		$7.84		4700
	2 fiber loopTermination - Premises		$6.97		4700
9.8	**Shared Transport**				
9.9.1	Shared Transport per MOU		$0.001573		4679
9.10	**Local Tandem Switching**				
9.10.1	DS1 Trunk Port Facility		$59.28	$219.99	4679/4591
9.10.2	Member Trunk Port 1st			$210.14	4591
9.10.3	Member Trunk Port Ea. Add'l			$24.38	4591
9.10.4	Local Tandem Switching per MOU		$0.002453		
9.11	**Local Switching**				
9.11.1	DS0 Analog Line Port		$1.33	$144.93	4679/4591
9.11.2	Each Addditional DS0 Analog Line Port		$1.33	$95.34	4679/4591
9.11.3	Local Switching UNE per MOU		$0.002684		

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.11.4	**VERTICAL FEATURES**				
	10XXX Direct Dialed Blocking		$0.08		4705
	Account Codes - per system		$7.56	$79.66	47054591
	Attendant Access Line - per station line		$0.08	$1.15	47054591
	Audible Message Waiting		$0.13	$1.01	47054591
	Authorization Codes - per system		$3.25	$238.25	47054591
	Auto Callback		$0.08		4705
	Automatic Line		$0.07	$0.34	4705
	Automatic Route Selection - Common Equip. per system		$2.20	$2,090.41	4705
	Blocking of pay per call services		$0.10		4705
	Bridging		$0.07		4705
	Call Drop		$0.07	$0.34	4705
	Call Exclusion - Automatic		$0.07	$1.01	4705
	Call Exclusion - Manual		$0.07	$0.67	4705
	Call Forward Don't Answer - All Calls		$0.13		4705
	Call Forwarding Incoming Only		$0.08		4705/4591
	Call Forwarding Intra Group Only		$0.08		4705/4591
	Call Forwarding Variable Remote		$0.11		4705/4591
	Call Forwarding: Busy Line (Expanded)		$0.09		4705/4591
	Call Forwarding: Busy Line (External)		$0.09		4705/4591
	Call Forwarding: Busy Line (External) Don't Answer		$0.15		4705
	Call Forwarding: Busy Line (Overflow)		$0.09		4705
	Call Forwarding: Busy Line (Overflow) Don't Answer		$0.15		4705
	Call Forwarding: Busy Line (Programmable)		$0.10		4705
	Call Forwarding: Busy Line/Don't Answer Programmable Svc. Establishment			$15.59	4591
	CF DON'T ANSWER/CF BUSY CUSTOMER PROGRAMMABLE - PER LINE			$1.01	4591
	Call Forwarding: Busy Line/Don't Answer (Expanded)		$0.15	$37.75	4705/4591
	Call Forwarding: Don't Answer		$0.13	$37.75	4705/4591
	Call Forwarding: Don't Answer (Expanded)		$0.13		4705/4591
	Call Forwarding: Don't Answer (Programmable)		$0.13		4705/4591
	Call Forwarding: Variable		$0.10		4705/4591
	Call Forwarding: Variable - no call complete option		$0.10		4705/4591
	Call Hold		$0.08		4705

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	Call Hold/3-Way/Call Transfer		$0.33		4705
	Call Park (Basic - Store & Retrieve)		$0.09		4705/4591
	Call Pickup		$0.08		4705/4591
	Call Transfer		$0.33		4705/4591
	Call Waiting Dial Originating		$0.08		4705
	Call Waiting Indication - per timing state		$0.47	$1.01	4591
	Call Waiting Originating		$0.09		4591
	Call Waiting Terminating - All Calls		$0.12		4591
	Call Waiting Terminating - Incoming Only		$0.12		4591
	Call Waiting/ Cancel Call Waiting		$0.14		4591
	CENTREX COMMON EQUIPMENT			$1,200.97	4591
	Centrex Management System (CMS)		$0.60		4705
	Centrex Plus DID numbers per number		$0.12		4705
	Centrex Plus to Centrex Plus		$5.49		4705
	Centrex Plus to IC Carrier		$5.49		4705
	Centrex Plus to PBX/Key Blocked		$5.49		4705
	Centrex Plus to PBX/Key Non-Blocked		$5.49		4705
	CFBL - All Calls		$0.09		4705
	CFBL - Incoming Only		$0.09	$37.75	4705/4591
	CFDA Incoming Only		$0.12	$37.75	4705/4591
	CLASS - Anonymous Call Rejection		$0.14		4705
	CLASS - Call Waiting ID		$0.60		4705
	CLASS - Calling Name & Number		$0.12		4705
	CLASS - Calling Number Delivery		$5.49		4705
	CLASS - Calling Number Delivery - Blocking		$5.49		4705
	CLASS - Continuous Redial		$5.49	$1.26	4705/4591
	CLASS - Last Call Return		$5.49	$1.26	4705/4591
	CLASS - Priority Calling		$0.09	$1.20	4705/4591
	CLASS - Selective Call Forwarding		$0.09	$1.26	4705/4591
	CLASS - Selective Call Rejection		$1.67	$1.20	4591
	Common Equipment per 1.544 Mbps facility (DS1)		$60.34		4705
	Conference Calling - Meet Me		$14.60	$42.29	4705/4591
	Conference Calling - Preset		$11.15	$42.29	4705/4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	Custom Ringing First Line (Short/Long/Short)		$0.09		4705
	Custom Ringing First Line (Short/Short)		$0.09		4705
	Custom Ringing First Line (Short/Short/Long)		$0.09		4705
	Custom Ringing Second Line (Short/Long/Short)		$0.09		4705
	Custom Ringing Second Line (Short/Short)		$0.09		4705
	Custom Ringing Second Line (Short/Short/Long)		$0.09		4705
	Custom Ringing Third Line (Short/Long/Short)		$0.08		4705
	Custom Ringing Third Line (Short/Short)		$0.08		4705
	Custom Ringing Third Line (Short/Short/Long)		$0.08		4705/4591
	Data Call Protection (DMS 100)		$0.07		4705/4591
	Dir Sta Sel/Busy Lamp Fld per arrangement		$1.83	$0.34	4705/4591
	Directed Call Pickup with Barge-in		$0.18	$20.08	4705/4591
	Directed Call Pickup without Barge-in		$0.10	$20.08	4705/4591
	Distinctive Ring/Distinctive Call Waiting		$0.09	$40.14	4705/4591
	Distinctive Ringing		$0.09		4705
	EBS - Set Interface - per station line		$1.44		4705
	Executive Busy Overide		$0.08		4705
	Expensive Route Warning Tone- per system		$0.07	$71.60	4705
	Facility Restriction Level - per system		$0.07	$44.05	4705
	Feature Display		$0.07		4705/4591
	Group Intercom		$0.16	$0.45	4705/4591
	Hot Line - per line		$0.13	$1.01	4705/4591
	Hunting: Multiposition Circular Hunting		$0.27		4705/4591
	Hunting: Multiposition Hunt Queuing		$0.23	$38.42	4705/4591
	Hunting: Multiposition Series Hunting		$0.27		4705
	Hunting: Multiposition with Announcement in Queue		$3.20	$38.42	4591
	Hunting: Multiposition with Music in Queue		$1.14	$40.57	4705/4591
	Incoming Calls Barred		$0.08		4705
	International Direct Dial Blocking		$0.09		4705/4591
	ISDN Short Hunt		$0.58	$1.69	4705/4591
	Line Side Answer Supervision		$0.09		4705
	Loudspeaker Paging - per trunk group		$21.96	$175.77	4705/4591
	Make Busy Arrangements - per group		$0.36	$0.67	4705/4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	Make Busy Arrangements - per line		$0.15	$0.67	4705/4591
	Message Center - per main station line		$0.07	$0.34	4705/4591
	Message Waiting Indication Audible/Visual		$0.13		4705
	Message Waiting Visual		$0.13	$0.34	4705/4591
	Music On Hold - per system		$22.87	$23.03	4705/4591
	Network Speed Call		$0.07		4705
	Night Service Arrangement		$0.08		4705/4591
	Outgoing Calls Barred		$0.08		4705/4591
	Outgoing Trunk Queuing		$0.13		4705/4591
	Privacy Release		$0.08	$0.47	4591
	Query Time		$0.25	$0.34	4705/4591
	Speed Calling 1 Digit Controller		$0.08		4705/4591
	Speed Calling 1 Digit User		$0.08		4705
	Speed Calling 1# List Individual		$0.08		4705
	Speed Calling 2 Digit Controller		$0.08		4705
	Speed Calling 2 Digit User		$0.08		4705
	Speed Calling 2# List Individual		$0.08		4705/4591
	Speed Calling 30 Number		$0.08		4705/4591
	Speed Calling 8 Number		$0.08		4705
	Station Camp-On Service - per main station		$8.51	$0.34	4705/4591
	Station Dial Conferencing (6 Way)		$1.48		4705
	Station Message Detail Recording (SMDR)		$0.18		4705
	Three Way Calling		$0.33		4705
	Time and Date Display		$0.18		4705
	Time of Day Control for ARS - per system		$0.07	$125.28	4705/4591
	Time of Day NCOS Update		$0.08	$0.54	4705/4591
	Time of Day Routing - per line		$0.13	$0.51	4705/4591
	Toll Restriction Service		$0.08		4705
	Trunk Answer Any Station		$0.08		4591
	Trunk Verification from Designated Station		$0.07	$0.39	4705/4591
	UCD in hunt group - per line		$8.23	$0.67	4705/4591
	UCD with Music After Delay		$5.45		4705/4591
	CMS - SYSTEM ESTABLISHMENT - INITIAL INSTALLATION			$967.37	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	CMS - SYSTEM ESTABLISHMENT - SUBSEQUENT INSTALLATION			$483.69	4591
	CMS - PACKET CONTROL CAPABILITY, PER SYSTEM			$483.69	4591
	SMDR-P - SERVICE ESTABLISHMENT CHARGE, INITIAL INSTALLATION			$337.82	4591
	SMDR-P - ARCHIVED DATA			$176.52	4591
	CLASS - Call Trace (per occurrence)			$2.40	4270
9.11.5	Subsequent Order Charge			$13.51	4591
9.11.6	Unbundled 2 Wire Digital Line Port (BRI/ISDN)		$11.19	$218.41	4679/4591
	Unbundled 2 Wire Digital Line Port (BRI/ISDN) Ea. Add'l	Same as 9.12.1.5.1			
9.11.6	**Digital Trunk Ports**				
	UnBundled DS1 DID Trunk Port Facility		$3.52	$211.81	4591
	UNBUNDLED (DS0) DIGITAL TRUNK PORT - 1ST			$208.23	
	UNBUNDLED (DS0) DIGITAL TRUNK PORT - ADDITIONAL			$50.62	
	Unbundled DS1 PRI - ISDN Trunk Port		$238.22	$645.72	4679/4591
	MEMBER (DS0) TRUNK PORT - 1ST	Same as 9.12.1.6.2			
	MEMBER DS0 TRUNK PORT - ADDITIONAL	Same as 9.12.1.6.3			
9.11.6	DS0 Trunk Port		$16.98		4679
	Unbundled (DS0) Analog Trunk Port, First			$122.58	4591
	Unbundled (DS0) Analog Trunk Port, E.a Add'l			$28.45	4591
9.12.1.8	Local Switching UNE per Minute of Use		$0.002684		4679
	COMMON CHANNEL SIGNALING/SS7				
9.13.1	STP Port		$260.09	$438.36	4679/4591
9.13.2.1	CCSAC OPTIONS BASIC FIRST ACTIVATION PER ORDER			$114.83	4591
9.13.2.1	CCSAC OPTIONS BASIC EACH ADDL ACTIVATION PER ORDER			$9.53	4591
9.13.2.2	CCSAC OPTIONS DATABASE FIRST ACTIVATION PER ORDER			$133.90	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.13.2.2	CCSAC OPTIONS DATABASE EA ADDL ACTIVATION PER ORDER			$57.20	4591
9.13.3	ISUP Signal Formulation		$0.0020817		4679
9.13.4	ISUP Signal Transport		$0.0013398		4679
9.13.5	TCAP Signal Transport		$0.0002974		4679
9.13.6	ISUP Signal Switching		$0.0009411		4679
9.13.7	TCAP Signal Switching		$0.0005910		4679
9.15.3	LIDB per Query		$0.0009621	Same as 9.14.2.2	4679

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.16	**8XX DATABASE QUERY SERVICE**				
9.16.1	Basic Query, per Query		$0.02000723	Same as 9.14.2.2	4679
9.16.2	POTS Translation		$0.00000057		4679
9.16.3	Call Handling & Destination Feature		$0.00000172		4679
9.17	**ICNAM, PER QUERY**				
9.18	UCNAM Query - per Query		$0.000849	Same as 9.14.2.2	4673
9.19	**Miscellaneous Elements**				
	ADDITIONAL ENGINEERING - BASIC (PER HALF HOUR)			$31.70	4591
	ADDITIONAL ENGINEERING - OVERTIME (PER HALF HOUR)			$39.21	4591
	ADDITIONAL LABOR INSTALLATION - OVERTIME (PER HALF HOUR)			$9.01	4591
	ADDITIONAL LABOR INSTALLATION - PREMIUM (PER HALF HOUR)			$18.02	4591
	ADDITIONAL LABOR OTHER - BASIC (PER HALF HOUR)			$27.63	4591
	ADDITIONAL LABOR OTHER - OVERTIME (PER HALF HOUR)			$36.90	4591
	ADDITIONAL LABOR OTHER - PREMIUM (PEER HALF HOUR)			$46.19	4591
	TESTING AND MAINTENANCE - BASIC (PER HALF HOUR)			$29.35	4591
	TESTING AND MAINTENANCE - OVERTIME (PER HALF HOUR)			$39.21	4591
	TESTING AND MAINTENANCE - PREMIUM (PER HALF HOUR)			$49.06	4591
	MAINTENANCE OF SERVICE - BASIC (PER HALF HOUR)			$27.63	4591
	MAINTENANCE OF SERVICE - OVERTIME (PER HALF HOUR)			$36.90	4591
	MAINTENANCE OF SERVICE - PREMIUM (PER HALF HOUR)			$46.19	4591
	ADDITIONAL COOP ACCEPTANCE TESTING - BASIC (PER HALF HOUR)			$29.35	4591
	ADDITIONAL COOP ACCEPTANCE TESTING - OVERTIME (PER HALF HOUR)			$39.21	4591
	ADDITIONAL COOP ACCEPTANCE TESTING - PREMIUM (PER HALF HOUR)			$49.06	4591
	NONSCHEDULED COOP TESTING - BASIC (PER HALF HOUR)			$29.35	4591
	NONSHCEDULED COOP TESTING - OVERTIME (PER HALF HOUR)			$39.21	4591
	NONSCHEDULED COOP TESTING - PREMIUM (PER HALF HOUR)			$49.06	4591
	NONSCHEDULED MANUAL TESTING - BASIC (PER HALF HOUR)			$29.35	4591
	NONSCHEDULED MANUAL TESTING - OVERTIME (PER HALF HOUR)			$39.21	4591
	NONSCHEDULED MANUAL TESTING - PREMIUM (PER HALF HOUR)			$49.06	4591
	COOPERATIVE SCHEDULED TESTING - LOSS (PER MONTH)			$0.08	4591
	COOPERATIVE SCHEDULED TESTING - C-MESSAGE NOISE (PER MONTH)			$0.08	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
	COOPERATIVE SCHEDULED TESTING - BALANCE (PER MONTH)			$0.33	4591
	COOPERATIVE SCHEDULED TESTING - GAIN SLOPE (PER MONTH)			$0.08	4591
	COOPERATIVE SCHEDULED TESTING - C-NOTCHED NOISE (PER MONTH)			$0.08	4591
	MANUAL SCHEDULED TESTING - LOSS (PER MONTH)			$0.17	4591
	MANUAL SCHEDULED TESTING - C-MESSAGE NOISE (PER MONTH)			$0.17	4591
	MANUAL SCHEDULED TESTING - BALANCE (PER MONTH)			$0.66	4591
	MANUAL SCHEDULED TESTING - GAIN SLOPE (PER MONTH)			$0.17	4591
	MANUAL SCHEDULED TESTING - C-NOTCHED NOISE (PER MONTH)			$0.17	4591
	ADDITIONAL DISPATCH CHARGE			$84.23	4591
	DATE CHANGE			$10.36	4591
	DESIGN CHANGE			$73.78	4591
	DS1 Regeneration		$9.45	$480.05	4703
	DS3 Regeneration		$34.16	$1,807.55	4703

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.21	**UNE-Platform**				
9.22.1.1	UNE-PLATFORM POTS, CENTREX, PAL, ANALOG PBX FIRST MECHANIZED EXISTING SERVICE			$0.68	4591
9.22.1.1	UNE-PLATFORM POTS, CENTREX, PAL, ANALOG PBX EA ADDL MECHANIZED EXISTING SERVICE			$0.14	4591
9.21.1.2	UNE-PLATFORM POTS, CENTREX, PAL, ANALOG PBX FIRST MANUAL EXISTING SERVICE			$16.21	4591
9.21.1.2	UNE-PLATFORM POTS, CENTREX, PAL, ANALOG PBX EA ADDL MANUAL EXISTING SERVICE			$2.70	4591
9.21.1.3	UNE-PLATFORM PBX DID TRUNKS EXISTING SERVICE			$20.61	4591
9.21.1.3	UNE-PLATFORM PBX DID TRUNKS EXISTING SERVICE EACH ADDL			$3.12	4591
9.21.1.4	UNE-PLATFORM ISDN BRI EXISTING SERVICE FIRST			$15.09	4591
9.21.1.4	UNE-PLATFORM ISDN BRI EXISTING SERVICE EACH ADDL			$3.12	4591
9.21.1.5	UNE-PLATFORM ISDN PRI, DSS Per DS1 Facility EXISTING SERVICE			$51.00	4591
9.21.1.6	UNE-PLATFORM ISDN PRI, DSS Per First Trunk EXISTING SERVICE			$18.77	4591
9.21.1.6	UNE-PLATFORM ISDN PRI, DSS Per Each Addl Trunk EXISTING SERVICE			$3.12	4591
9.21.2.1	UNE-PLATFORM POTS FIRST LINE MECHANIZED NEW SERVICE			$55.31	4591
9.21.2.1	UNE-PLATFORM POTS EA ADDL LINE MECHANIZED NEW SERVICE			$15.87	4591
9.21.2.2	UNE-PLATFORM POTS FIRST LINE MANUAL NEW SERVICE			$82.11	4591
9.21.2.2	UNE-PLATFORM POTS EA ADDL LINE MANUAL NEW SERVICE			$18.44	4591
9.21.3	UNE-COMBINATION PRIVATE LINE DS0/DS1/DS3/OCN/INTERGRATED T1 EXISTING SERVICE			$40.87	4591
9.21.4	**ENHANCED EXTENDED LOOP (EEL)**				
9.21.4.1	DS0 ENHANCED EXTENDED LINK FIRST			$249.10	4591
9.21.4.1	DS0 ENHANCED EXTENDED LINK EACH ADDITIONAL			$217.86	4591
9.21.4.1	DS1 ENHANCED EXTENDED LINK FIRST			$306.85	4591
9.21.4.1	DS1 ENHANCED EXTENDED LINK EACH ADDIDTIONAL			$261.17	4591
9.21.4.1	DS3 ENHANCED EXTENDED LINK FIRST			$331.21	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
9.21.4.1	DS3 ENHANCED EXTENDED LINK EACH ADDIDTIONAL			$285.53	4591
9.21.4.3	DS1 ENHANCED EXTENDED LINK TRANSPORT MUX			$257.04	4591
9.21.4.3	DS3 ENHANCED EXTENDED LINK TRANSPORT MUX			$257.04	4591
9.21.4.2	**EEL Transport**				
9.21.4.2	DS0 EEL Transport			$306.61	
9.21.4.2	DS0 Over 0 to 8 Miles	$20.93	$0.14		4679
9.21.4.2	DS0 Over 8 to 25 Miles	$20.95	$0.12		4679
9.21.4.2	DS0 Over 25 to 50 Miles	$20.99	$0.13		4679
9.21.4.2	DS0 Over 50 Miles	$20.94	$0.06		4679
9.23.4.2	DS1 EEL Transport			$351.39	
9.21.4.2	DS1 Over 0 to 8 Miles	$33.05	$1.56		4679
9.21.4.2	DS1 Over 8 to 25 Miles	$33.33	$1.26		4679
9.21.4.2	DS1 Over 25 to 50 Miles	$33.81	$2.28		4679
9.21.4.2	DS1 Over 50 Miles	$33.78	$1.19		4679
9.21.4.2	DS3 EEL Transport			$351.39	
9.21.4.2	DS3 Over 0 to 8 Miles	$210.28	$65.55		4679
9.21.4.2	DS3 Over 8 to 25 Miles	$213.45	$20.30		4679
9.21.4.2	DS3 Over 25 to 50 Miles	$196.74	$25.43		4679
9.21.4.2	DS3 Over 50 Miles	$207.61	$17.49		4679
9.21.4.3	**Multiplexing**				
9.21.4.3	DS3 to DS1		$246.64	$267.45	4679
9.21.4.3	DS1 to DS0		$229.32	$267.45	4679
9.21.4.4	**DS0 Channel Performance**				
9.21.4.4	DS0 Low Side Channelization		$13.90		4678
9.21.4.4	DS1/DS0 MUX, Low Side Channelization		$8.87	$238.79	4678
10.8	**ACCESS TO POLES, DUCTS, CONDUITS AND RIGHT OF WAY**				
10.8.1	Pole Inquiry Fee, per Mile			$321.59	4591

Summary of Recurring and Nonrecurring Costs

Section Number	Cost Element	Recurring & Recurring/Fixed (if appropriate) TELRIC + Common	Rec & Rec/Mile (if applicable) TELRIC + Common	Non-Recurring (TELRIC+Common)	COST STUDY ID#
10.8.2	Innerduct Inquiry Fee, per Mile			$386.56	4591
10.8.3	ROW Inquiry Fee			$142.86	4591
	ROW Document Preparation			$142.86	4591
10.8.4	Field Verification Fee, per Pole			$35.72	4591
10.8.5	Field Verification Fee, per Manhole			$464.31	4591
	Planner Verication, Per Manhole			$15.93	4591
	Manhole Verication Inspector per Manhole			$285.73	4591
	Manhole Make-Ready Inspector per Manhole			$428.59	4591
10.8.8	Pole Atachment Fee, per Foot, per Year		$4.34	Poles Attachment Formula	
10.8.9	Innerduct Occupancy Fee, per Foot, per Year		$0.37	Conduit Attachment Formula	
12.0	**OPERATIONAL SUPPORT SYSTEMS**				
12.1	Daily Usage Record File, per Record		$0.0007616		4672
17.0	**Bona fide Request Process**			$2,400.07	4591

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-02
March 15, 2001

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibiti TKM-03
March 15, 2001

REDACTED

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-05
March 15, 2001

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Exhibit TKM-06

Collocation

Study ID #4694
Version 1.0 Created 3/8/01, 12:59:26 PM

Arizona

USWEST

Collocation Model (CM) Interconnection TELRIC Results

Study I D # 4694

2001 Cost Study

Market Services & MSEA Economic Analysis

CM Output
Table of Contents

Version 1.0 Created 3/8/01, 12:59:26 PM Arizona	Units	90 Day Initial Charge (sA p6-9)	Monthly Rate (sA p6-9)
1 Standard Collocation			
1.1 Terminations			
DS0			
Cable Placement	Per Block	$243.35	$0.5701
	Per Termination	$4.57	$0.0107
Cable	Per Block	$313.03	$0.7333
	Per Termination	$4.29	$0.0100
Blocks	Per Block	$545.80	$1.2786
	Per Termination	$7.48	$0.0175
Block Placement	Per Block	$252.40	$0.5913
	Per Termination	$3.46	$0.0081
DS1			
Cable Placement	Per Block	$404.75	$0.7386
	Per Termination	$43.52	$0.0794
Cable	Per Block	$361.38	$0.6594
	Per Termination	$38.86	$0.0709
Panel	Per Block	$412.36	$0.7525
	Per Termination	$49.78	$0.0908
Panel Placement	Per Block	$86.36	$0.1576
	Per Termination	$9.29	$0.0169
DS3			
Cable Placement	Per Termination	$164.79	$0.3007
Cable	Per Termination	$233.36	$0.4258
Panel/Connector	Per Termination	$240.45	$0.4388
Panel/Connector Placement	Per Termination	$24.81	$0.0453
1.2 Entrance Facility			
Standard Shared	Per Fiber	$1,232.89	$15.17
Cross Connect	Per Fiber	$1,658.09	$22.75
Express	Per Cable	$8,783.09	$240.26
1.3 Cable Splicing			
Setup	Per Setup	$474.74	
Per fiber Spliced	Per Fiber	$37.95	

Version 1.0 Created 3/8/01, 12:59:26 PM			
Arizona			
		90 Day	
	Units	Initial Charge (sA p6-9)	Monthly Rate (sA p6-9)
1.4 Power Usage			
Power Plant per Amp Ordered			
Power Plant	Per AMP Ordered		$11.36
Power Usage-Less than 60 AMPS	Per AMP Ordered		$3.69
Power Usage-More than 60 AMPS	Per AMP Used		$7.37
Backup AC Power Feed Usage			
120 V	Per Amp Per Month		$19.26
208 V, Single Phase	Per Amp Per Month		$33.38
208 V, Three Phase	Per Amp Per Month		$57.75
240 V, Single Phase	Per Amp Per Month		$38.52
240 V, Three Phase	Per Amp Per Month		$66.64
480 V, Three Phase	Per Amp Per Month		$133.28
Backup AC Power Cable			
20 Amp, Single Phase	Per Foot, Per Month	$7.98	$0.0146
20 Amp, Three Phase	Per Foot, Per Month	$9.90	$0.0181
30 Amp, Single Phase	Per Foot, Per Month	$8.61	$0.0157
30 Amp, Three Phase	Per Foot, Per Month	$11.82	$0.0216
40 Amp, Single Phase	Per Foot, Per Month	$10.12	$0.0185
40 Amp, Three Phase	Per Foot, Per Month	$13.93	$0.0254
50 Amp, Single Phase	Per Foot, Per Month	$12.01	$0.0219
50 Amp, Three Phase	Per Foot, Per Month	$16.76	$0.0306
60 Amp, Single Phase	Per Foot, Per Month	$13.58	$0.0248
60 Amp, Three Phase	Per Foot, Per Month	$19.29	$0.0352
100 Amp, Single Phase	Per Foot, Per Month	$16.81	$0.0307
100 Amp, Three Phase	Per Foot, Per Month	$26.24	$0.0479
1.5 Security			
Access Card	Per Employee		$0.87
Card Access	Per Person per Office per Month		$8.07
1.6 Central office Clock Synchronization	Per Port		$7.70
1.7 Interconnection Tie Pair			
DS0	Per Connection		$0.51
DS1	Per Connection		$1.58
DS3	Per Connection		$15.92

Version 1.0 Created 3/8/01, 12:59:26 PM Arizona		90 Day	
	Units	Initial Charge (sA p6-9)	Monthly Rate (sA p6-9)
2 Cageless Collocation			
2.1 Space Construction			
No QPF Retained	Space for 2 Bays, 1 40 Amp Power Ca	$29,823.10	$54.42
If contract has provisions to collect and retain a Quote Preparation fee that fee would be deducted from the space construction charge			
DC Power Cable-Change to standard design			
20 Amp-Initial Feed Only	Per Initial Power Feed	($2,177.62)	($3.97)
30 Amp-Initial Feed Only	Per Initial Power Feed	($1,389.75)	($2.54)
40 Amp-Initial Feed Only	Per Initial Power Feed	N/A	N/A
60 Amp-Initial Feed Only	Per Initial Power Feed	$1,907.82	$3.48
Each Additional Bay	Per Bay	$3,024.83	$5.52
DC Power Cable-Additional Power Cables			
20 Amp-Does not apply to initial power feed	Per Additional Feed	$5,528.47	$10.09
30 Amp-Does not apply to initial power feed	Per Additional Feed	$6,316.35	$11.53
40 Amp-Does not apply to initial power feed	Per Additional Feed	$7,706.09	$14.06
60 Amp-Does not apply to initial power feed	Per Additional Feed	$9,613.92	$17.54
2.2 Rent	Per Square Foot		$3.9625
2.3 Quote Preparation Fee	Per Collocation Ordered	$4,380.68	

Version 1.0 Created 3/8/01, 12:59:26 PM			
Arizona			
		90 Day	
	Units	Initial Charge (sA p6-9)	Monthly Rate (sA p6-9)
3 Caged Collocation			
3.1 Space Construction			
Cage-Up to 100 Sq Ft	Cage&1 60 Amp Feed	$51,675.14	$94.30
Cage-101 Sq Ft to 200 Sq Ft	Cage&1 60 Amp Feed	$53,623.79	$97.85
Cage-201 Sq Ft to 300 Sq Ft	Cage&1 60 Amp Feed	$55,139.10	$100.62
Cage-301 Sq Ft to 400 Sq Ft	Cage&1 60 Amp Feed	$57,038.08	$104.08
If contract has provisions to collect and retain a Quote Preparation fee that fee would be deducted from the space construction charge			
DC Power Cable-Change to standard design			
20 Amp-Initial Feed Only	Per Initial Power Feed	($8,444.49)	($15.41)
30 Amp-Initial Feed Only	Per Initial Power Feed	($7,687.98)	($14.03)
40 Amp-Initial Feed Only	Per Initial Power Feed	($6,106.39)	($11.14)
60 Amp-Initial Feed Only	Per Initial Power Feed	NA	NA
100 Amp-Initial Feed Only	Per Initial Power Feed	$9,348.19	$17.06
200 Amp-Initial Feed Only	Per Initial Power Feed	$29,843.97	$54.46
300 Amp-Initial Feed Only	Per Initial Power Feed	$54,756.39	$99.92
400 Amp-Initial Feed Only	Per Initial Power Feed	$84,219.54	$153.68
DC Power Cable-Added Power Feeds			
20 Amp-Does not apply to initial power feed	Per Additional Feed	$6,973.86	$12.73
30 Amp-Does not apply to initial power feed	Per Additional Feed	$7,730.36	$14.11
40 Amp-Does not apply to initial power feed	Per Additional Feed	$9,311.95	$16.99
60 Amp-Does not apply to initial power feed	Per Additional Feed	$15,418.34	$28.14
100 Amp-Does not apply to initial power feed	Per Additional Feed	$24,766.54	$45.19
200 Amp-Does not apply to initial power feed	Per Additional Feed	$45,262.31	$82.59
300 Amp-Does not apply to initial power feed	Per Additional Feed	$70,174.74	$128.05
400 Amp-Does not apply to initial power feed	Per Additional Feed	$99,637.89	$181.82
3.2 Grounding			
#2 AWG	Per Foot	$12.59	$0.0230
1/0 AWG	Per Foot	$20.96	$0.0382
4/0 AWG	Per Foot	$23.81	$0.0435
350 KCMIL	Per Foot	$33.04	$0.0603
500 KCMIL	Per Foot	$36.81	$0.0672
750 KCMIL	Per Foot	$56.40	$0.1029
3.3 Rent	Per Square Foot		$3.96
3.4 Quote Preparation Fee	Per Collocation Ordered	$4,763.06	

Version 1.0 Created 3/8/01, 12:59:26 PM			
Arizona			
		90 Day	
	Units	**Initial Charge (sA p6-9)**	**Monthly Rate (sA p6-9)**
4 Virtual Collocation			
4.1 Equipment Bay	Per Shelf		$3.75
4.2 Labor			
Maintenance - Regular Business Hours	Per 1/2 Hour	$27.97	
Maintenance - Outside Regular Business Hour	Per 1/2 Hour	$37.43	
Training - Regular Business Hours	Per 1/2 Hour	$27.97	
Inspector - Regular Business Hours	Per 1/2 Hour	$31.89	
Inspector - Outside Regular Business Hours	Per 1/2 Hour	$41.07	
Installation - Regular Business Hours	Per 1/2 Hour	$31.89	
Installation - Outside Regular Business Hours	Per 1/2 Hour	$41.07	
Engineering - Regular Business Hours	Per 1/2 Hour	$30.18	
Engineering - Outside Regular Business Hours	Per 1/2 Hour	$38.96	
4.3 Quote Preparation Fee	Per Collocation Ordered	$4,380.68	

A. Detailed Summary of Results

Arizona Interconnection Services Collocation				
Cost Element	Investment	TELRIC	Common	TELRIC + Common
	sB r1	sB r28	sB r38	
Version 1.0 Created 3/8/01, 12:59:26 PM				
1 Standard Collocation				
1.1 Terminations				
1.1.2 Terminations - 90 Day Installation				
DS0 - 90 Day Installation				
DS0 Cable Placement per 100 Pair Block - 90 Day		$233.16	$10.19	$243.35
DS0 Cable Placement per Termination - 90 Day		$4.38	$0.19	$4.57
DS0 Cable per 100 Pair Block - 90 Day		$299.92	$13.11	$313.03
DS0 Cable per Termination - 90 Day		$4.11	$0.18	$4.29
DS0 Blocks per 100 Pair Block - 90 Day		$522.94	$22.86	$545.80
DS0 Blocks per Termination - 90 Day		$7.16	$0.31	$7.48
DS0 Block Placement per 100 Pair Block - 90 Day		$241.82	$10.57	$252.40
DS0 Block Placement per Termination - 90 Day		$3.31	$0.14	$3.46
DS1 - 90 Day Installation				
DS1 Cable Placement per 28 DS1s - 90 Day		$387.80	$16.95	$404.75
DS1 Cable Placement per Termination - 90 Day		$41.70	$1.82	$43.52
DS1 Cable per 28 DS1s - 90 Day		$346.25	$15.14	$361.38
DS1 Cable per per Termination - 90 Day		$37.23	$1.63	$38.86
DS1 Panel per 28 DS1s - 90 Day		$395.08	$17.27	$412.36
DS1 Panel per Termination - 90 Day		$47.70	$2.08	$49.78
DS1 Panel Placement per 28 DS1s - 90 Day		$82.75	$3.62	$86.36
DS1 Panel Placement per Termination - 90 Day		$8.90	$0.39	$9.29
DS3 - 90 Day Installation				
DS3 Cable Placement per Termination - 90 Day		$157.89	$6.90	$164.79
DS3 Cable per Termination - 90 Day		$223.59	$9.77	$233.36
DS3 Connector per Termination - 90 Day		$230.38	$10.07	$240.45
DS3 Connector Placement per Termination - 90 Day		$23.77	$1.04	$24.81
1.1.3 Terminations - Monthly Charge				
DS0 - Monthly Charge				
DS0 Cable Placement per 100 pair per month		$0.5462	$0.0239	$0.5701
DS0 Cable Placement per Termination per month		$0.0102	$0.0004	$0.0107
DS0 Cable per 100 pair per month		$0.7026	$0.0307	$0.7333
DS0 Cable per Termination per month		$0.0096	$0.0004	$0.0100
DS0 Blocks per 100 pair per month		$1.2251	$0.0536	$1.2786
DS0 Blocks per Termination per month		$0.0168	$0.0007	$0.0175
DS0 Block Placement per 100 pair per month		$0.5665	$0.0248	$0.5913
DS0 Block Placement per Termination per month		$0.0078	$0.0003	$0.0081
DS1 - Monthly Charge				
DS1 Cable Placement per 28 DS1s per month		$0.7076	$0.0309	$0.7386
DS1 Cable Placement per Termination per month		$0.0761	$0.0033	$0.0794
DS1 Cable per 28 DS1s per month		$0.6318	$0.0276	$0.6594
DS1 Cable per per Termination per month		$0.0679	$0.0030	$0.0709
DS1 Panel per 28 DS1s per month		$0.7209	$0.0315	$0.7525
DS1 Panel per Termination per month		$0.0870	$0.0038	$0.0908
DS1 Panel Placement per 28 DS1s per month		$0.1510	$0.0066	$0.1576
DS1 Panel Placement per Termination per month		$0.0162	$0.0007	$0.0169
DS3 - Monthly Charge				
DS3 Cable Placement per Termination per month		$0.2881	$0.0126	$0.3007
DS3 Cable per Termination per month		$0.4080	$0.0178	$0.4258
DS3 Connector per Termination per month		$0.4204	$0.0184	$0.4388
DS3 Connector Placement per Termination per month		$0.0434	$0.0019	$0.0453
1.2 Entrance Facility				
1.2.1 Entrance Facility - 90 Day Installation				
Standard Shared Per Fiber		$1,181.25	$51.64	$1,232.89
Cross Connect per Fiber		$1,588.64	$69.45	$1,658.09
Express per Cable		$8,415.22	$367.87	$8,783.09
1.2.2 Entrance Facility - Monthly Charge				
Standard Shared Per Fiber per month	$664.52	$14.54	$0.64	$15.17
Cross Connect per Fiber per month	$996.78	$21.79	$0.95	$22.75
Express per Cable per month	$10,882.64	$230.20	$10.06	$240.26
1.3 Cable Splicing - 90 Day Installation				

A. Detailed Summary of Results

Arizona Interconnection Services Collocation				
Cost Element	Investment	TELRIC	Common	TELRIC + Common
	sB r1	sB r28	sB r38	
Setup		$454.86	$19.88	$474.74
Per fiber Spliced		$36.36	$1.59	$37.95
1.4 Power Usage				
1.4.1 Power Plant per Amp Ordered				
Power Plant per Amp Ordered	$466.32	$10.8858	$0.4759	$11.3616
Power Usage-Less than 60 AMPS per Amp Ordered		$3.53	$0.15	$3.69
Power Usage-More than 60 AMPS per Amp Ordered		$7.06	$0.31	$7.37
1.4.2 Backup AC Power Feed Usage - Monthly Charges				
120 V per Amp per Month	$312.67	$18.45	$0.81	$19.26
208 V, Single Phase per Amp per Month	$541.97	$31.99	$1.40	$33.38
208 V, Three Phase per Amp per Month	$937.60	$55.34	$2.42	$57.75
240 V, Single Phase per Amp per Month	$625.35	$36.91	$1.61	$38.52
240 V, Three Phase per Amp per Month	$1,081.85	$63.85	$2.79	$66.64
480 V, Three Phase per Amp per Month	$2,163.70	$127.70	$5.58	$133.28
1.4.3 Backup AC Power Cable - 90 Day Installation				
20 Amp, Single Phase - Initial Charge per Foot		$7.65	$0.33	$7.98
20 Amp, Three Phase - Initial Charge per Foot		$9.48	$0.41	$9.90
30 Amp, Single Phase - Initial Charge per Foot		$8.25	$0.36	$8.61
30 Amp, Three Phase - Initial Charge per Foot		$11.32	$0.50	$11.82
40 Amp, Single Phase - Initial Charge per Foot		$9.70	$0.42	$10.12
40 Amp, Three Phase - Initial Charge per Foot		$13.34	$0.58	$13.93
50 Amp, Single Phase - Initial Charge per Foot		$11.50	$0.50	$12.01
50 Amp, Three Phase - Initial Charge per Foot		$16.06	$0.70	$16.76
60 Amp, Single Phase - Initial Charge per Foot		$13.01	$0.57	$13.58
60 Amp, Three Phase - Initial Charge per Foot		$18.49	$0.81	$19.29
100 Amp, Single Phase - Initial Charge per Foot		$16.10	$0.70	$16.81
100 Amp, Three Phase - Initial Charge per Foot		$25.15	$1.10	$26.24
1.4.4 Backup AC Power Cable - Monthly Charges				
20 Amp, Single Phase per Foot per Month		$0.0140	$0.0006	$0.0146
20 Amp, Three Phase per Foot per Month		$0.0173	$0.0008	$0.0181
30 Amp, Single Phase per Foot per Month		$0.0150	$0.0007	$0.0157
30 Amp, Three Phase per Foot per Month		$0.0207	$0.0009	$0.0216
40 Amp, Single Phase per Foot per Month		$0.0177	$0.0008	$0.0185
40 Amp, Three Phase per Foot per Month		$0.0244	$0.0011	$0.0254
50 Amp, Single Phase per Foot per Month		$0.0210	$0.0009	$0.0219
50 Amp, Three Phase per Foot per Month		$0.0293	$0.0013	$0.0306
60 Amp, Single Phase per Foot per Month		$0.0237	$0.0010	$0.0248
60 Amp, Three Phase per Foot per Month		$0.0337	$0.0015	$0.0352
100 Amp, Single Phase per Foot per Month		$0.0294	$0.0013	$0.0307
100 Amp, Three Phase per Foot per Month		$0.0459	$0.0020	$0.0479
1.5 Security				
Access Card per Employee	$9.09	$0.83	$0.04	$0.87
Card Access Per Person per Office per Month	$250.00	$7.74	$0.34	$8.07
1.6 Central office Clock Synchronization				
C O Clock Synchronization per Port	$316.20	$7.38	$0.32	$7.70
1.7 Interconnection Tie Pair				
DS0 Per Connection	$20.56	$0.48	$0.02	$0.51
DS1 Per Connection	$64.79	$1.51	$0.07	$1.58
DS3 Per Connection	$653.29	$15.25	$0.67	$15.92
Space Construction - General				
2 Cageless Collocation				
2.1 Space Construction				
2.1.1 Space Construction - 45 Day Installation				
2.1.2 Space Construction - 90 Day Installation				
Space Construction for 2 Bays and 1 - 40A Power Feed - 90 Day		$28,574.01	$1,249.09	$29,823.10
Space Construction Adjustment for 20A Initial Power Feed - 90 Day		-$2,086.42	-$91.21	-$2,177.62
Space Construction Adjustment for 30A Initial Power Feed - 90 Day		-$1,331.54	-$58.21	-$1,389.75
Space Construction Adjustment for 60A Initial Power Feed - 90 Day		$1,827.92	$79.91	$1,907.82

Arizona Interconnection Services Collocation				
Cost Element	Investment	TELRIC	Common	TELRIC + Common
	sB r1	sB r28	sB r38	
Space Construction Adjustment for Each Additional Bay - 90 Day		$2,898.14	$126.69	$3,024.83
Space Construction Adjustment for Each Additional 20A Power Feed - 90 Day		$5,296.92	$231.55	$5,528.47
Space Construction Adjustment for Each Additional 30A Power Feed - 90 Day		$6,051.80	$264.55	$6,316.35
Space Construction Adjustment for Each Additional 40A Power Feed - 90 Day		$7,383.34	$322.76	$7,706.09
Space Construction Adjustment for Each Additional 60A Power Feed - 90 Day		$9,211.25	$402.66	$9,613.92
2.1.3 Space Monthly Charge				
Space Monthly Charge for 2 Bays and 1 - 40A Power Feed per Month		$52.14	$2.28	$54.42
Space Monthly Charge Adjustment for 20A Initial Power Feed per Month		-$3.81	-$0.17	-$3.97
Space Monthly Charge Adjustment for 30A Initial Power Feed per Month		-$2.43	-$0.11	-$2.54
Space Monthly Charge Adjustment for 60A Initial Power Feed per Month		$3.34	$0.15	$3.48
Space Monthly Charge Adjustment for Each Additional Bay per Month		$5.29	$0.23	$5.52
Space Monthly Charge Adjustment for Each Additional 20A Power Feed per Month		$9.67	$0.42	$10.09
Space Monthly Charge Adjustment for Each Additional 30A Power Feed per Month		$11.04	$0.48	$11.53
Space Monthly Charge Adjustment for Each Additional 40A Power Feed per Month		$13.47	$0.59	$14.06
Space Monthly Charge Adjustment for Each Additional 60A Power Feed per Month		$16.81	$0.73	$17.54
2.2 Rent				
Rent per Square Foot	$170.44	$3.7966	$0.1660	$3.9625
2.3 Quote Preparation Fee - Cageless Construction				
Quotation Preparation Fee		$4,197.20	$183.48	$4,380.68
3 Caged Collocation				
3.1 Space Construction				
3.1.1 Space Construction - 90 Day Installation				
Cage-Up to 100 Sq Ft - 90 Day		$49,510.81	$2,164.33	$51,675.14
Cage-101 Sq Ft to 200 Sq Ft - 90 Day		$51,377.85	$2,245.94	$53,623.79
Cage-201 Sq Ft to 300 Sq Ft - 90 Day		$52,829.69	$2,309.41	$55,139.10
Cage-301 Sq Ft to 400 Sq Ft - 90 Day		$54,649.13	$2,388.95	$57,038.08
3.1.2 Initial Power Feed Adjustments - 90 Day				
Space Construction Adjustment for 20A Initial Power Feed - 90 Day		-$8,090.81	-$353.68	-$8,444.49
Space Construction Adjustment for 30A Initial Power Feed - 90 Day		-$7,365.98	-$322.00	-$7,687.98
Space Construction Adjustment for 40A Initial Power Feed - 90 Day		-$5,850.63	-$255.76	-$6,106.39
Space Construction Adjustment for 100A Initial Power Feed - 90 Day		$8,956.66	$391.53	$9,348.19
Space Construction Adjustment for 200A Initial Power Feed - 90 Day		$28,594.00	$1,249.97	$29,843.97
Space Construction Adjustment for 300A Initial Power Feed - 90 Day		$52,463.01	$2,293.38	$54,756.39
Space Construction Adjustment for 400A Initial Power Feed - 90 Day		$80,692.15	$3,527.40	$84,219.54
3.1.3 Each Additional Power Feed Adjustments - 90 Day				
Space Construction Adjustment for Each Additional 20A Power Feed - 90 Day		$6,681.77	$292.09	$6,973.86
Space Construction Adjustment for Each Additional 30A Power Feed - 90 Day		$7,406.59	$323.77	$7,730.36
Space Construction Adjustment for Each Additional 40A Power Feed - 90 Day		$8,921.94	$390.02	$9,311.95
Space Construction Adjustment for Each Additional 60A Power Feed - 90 Day		$14,772.57	$645.77	$15,418.34
Space Construction Adjustment for Each Additional 100A Power Feed - 90 Day		$23,729.23	$1,037.31	$24,766.54
Space Construction Adjustment for Each Additional 200A Power Feed - 90 Day		$43,366.57	$1,895.74	$45,262.31
Space Construction Adjustment for Each Additional 300A Power Feed - 90 Day		$67,235.58	$2,939.15	$70,174.74
Space Construction Adjustment for Each Additional 400A Power Feed - 90 Day		$95,464.72	$4,173.17	$99,637.89
3.1.4 Space Monthly Charge				
Cage-Up to 100 Sq Ft Monthly Charge		$90.35	$3.95	$94.30
Cage-101 Sq Ft to 200 Sq Ft Monthly Charge		$93.75	$4.10	$97.85
Cage-201 Sq Ft to 300 Sq Ft Monthly Charge		$96.40	$4.21	$100.62
Cage-301 Sq Ft to 400 Sq Ft Monthly Charge		$99.72	$4.36	$104.08
3.1.5 Initial Power Feed Monthly Charge Adjustments				
Space Monthly Charge Adjustment for 20A Initial Power Feed		-$14.76	-$0.65	-$15.41
Space Monthly Charge Adjustment for 30A Initial Power Feed		-$13.44	-$0.59	-$14.03
Space Monthly Charge Adjustment for 40A Initial Power Feed		-$10.68	-$0.47	-$11.14
Space Monthly Charge Adjustment for 100A Initial Power Feed		$16.34	$0.71	$17.06
Space Monthly Charge Adjustment for 200A Initial Power Feed		$52.18	$2.28	$54.46
Space Monthly Charge Adjustment for 300A Initial Power Feed		$95.73	$4.18	$99.92
Space Monthly Charge Adjustment for 400A Initial Power Feed		$147.25	$6.44	$153.68
3.1.6 Each Additional Power Feed Monthly Charge Adjustments				
Space Monthly Charge Adjustment for Each Additional 20A Power Feed		$12.19	$0.53	$12.73
Space Monthly Charge Adjustment for Each Additional 30A Power Feed		$13.52	$0.59	$14.11
Space Monthly Charge Adjustment for Each Additional 40A Power Feed		$16.28	$0.71	$16.99
Space Monthly Charge Adjustment for Each Additional 60A Power Feed		$26.96	$1.18	$28.14

A. Detailed Summary of Results

Arizona Interconnection Services Collocation				
Cost Element	**Investment**	**TELRIC**	**Common**	**TELRIC + Common**
	sB r1	**sB r28**	**sB r38**	
Space Monthly Charge Adjustment for Each Additional 100A Power Feed		$43.30	$1.89	**$45.19**
Space Monthly Charge Adjustment for Each Additional 200A Power Feed		$79.13	$3.46	**$82.59**
Space Monthly Charge Adjustment for Each Additional 300A Power Feed		$122.69	$5.36	**$128.05**
Space Monthly Charge Adjustment for Each Additional 400A Power Feed		$174.20	$7.62	**$181.82**
3.2 Grounding				
Grounding - 90 Day Installation				
#2 AWG per Foot - 90 Day		$12.07	$0.53	**$12.59**
1/0 AWG per Foot - 90 Day		$20.08	$0.88	**$20.96**
4/0 AWG per Foot - 90 Day		$22.81	$1.00	**$23.81**
350 KCMIL per Foot - 90 Day		$31.65	$1.38	**$33.04**
500 KCMIL per Foot - 90 Day		$35.27	$1.54	**$36.81**
750 KCMIL per Foot - 90 Day		$54.04	$2.36	**$56.40**
Grounding - Monthly Charge				
#2 AWG per Foot Monthly Charge		$0.0220	$0.0010	**$0.0230**
1/0 AWG per Foot Monthly Charge		$0.0366	$0.0016	**$0.0382**
4/0 AWG per Foot Monthly Charge		$0.0416	$0.0018	**$0.0435**
350 KCMIL per Foot Monthly Charge		$0.0578	$0.0025	**$0.0603**
500 KCMIL per Foot Monthly Charge		$0.0644	$0.0028	**$0.0672**
750 KCMIL per Foot Monthly Charge		$0.0986	$0.0043	**$0.1029**
3.3 Rent				
Rent per Square Foot	$170.44	$3.80	$0.17	**$3.96**
3.4 Quote Preparation Fee - Caged Construction				
Quotation Preparation Fee - Caged Construction		$4,563.57	$199.49	**$4,763.06**
4 Virtual Collocation				
4.1 Equipment Bay				
Equipment Bay per Shelf	$153.93	$3.59	$0.16	**$3.75**
4.2 Labor				
Maintenance - Regular Business Hours Per 1/2 Hour		$26.80	$1.17	**$27.97**
Maintenance - Outside Regular Business Hours Per 1/2 Hour		$35.86	$1.57	**$37.43**
Training - Regular Business Hours Per 1/2 Hour		$26.80	$1.17	**$27.97**
Inspector - Regular Business Hours Per 1/2 Hour		$30.56	$1.34	**$31.89**
Inspector - Outside Regular Business Hours Per 1/2 Hour		$39.35	$1.72	**$41.07**
Installation - Regular Business Hours Per 1/2 Hour		$30.56	$1.34	**$31.89**
Installation - Outside Regular Business Hours Per 1/2 Hour		$39.35	$1.72	**$41.07**
Engineering - Regular Business Hours Per 1/2 Hour		$28.92	$1.26	**$30.18**
Engineering - Outside Regular Business Hours Per 1/2 Hour		$37.33	$1.63	**$38.96**
4.3 Quote Preparation Fee - Virtual				
Quotation Preparation Fee - Virtual		$4,197.20	$183.48	**$4,380.68**

A. Detailed Summary of Results

Cell: A2

Comment: This spreadsheet is a summary of the costs calculated in Section B.

Cell: A9

Comment: 1.1 Terminations

Nonrecurring One Time Charge

Terminations are the network connections between the CLEC equipment and the USWEST network. These connections can be at a DS0, DS1 or DS3 level. The CLEC requires these elements to connect their equipment to the unbundled elements they are purchasing from USWEST. For example, an unbundled loop purchased by a CLEC will terminate on USWEST's network. The CLEC needs to have facilities to connect this unbundled loop to the equipment in their collocation space. Terminations are the cables and blocks that are used to make this connection. The termination costs are broken into four components:

1. The cables which are used to make the connection;
2. The blocks and panels needed to terminate the cables on the USWEST network;
3. The cost of placing the cable in the cable racks; and
4. The cost of placing the panels and blocks on the *intermediate distribution frame.*

Each of these components is broken out separately to allow the CLEC the opportunity to self-provision portions of these connections. If a CLEC prefers to supply its own cable or blocks, the rate for cable or blocks would not be assessed. However, the placement rates would still apply if USWEST places the blocks and the cable. Terminations end at a CLEC's equipment and are therefore dedicated to providing that CLEC service. All these costs are incurred solely for the collocator and will be recovered through a one-time charge based on the number of terminations, which are ordered. Terminations can be ordered on an individual basis or in quantities of 100 pairs for DS0's and 28 pairs for DS1's. The cost for bundles of cables represents the economies of 100 percent utilization of the placed facilities.

The nonrecurring cost does not include the cost of a dedicated frame (SPOT Frame), the cost of regenerating the signal to provide a higher grade of service, a direct connection to the COSMIC frame or other special configurations that may be requested by the carrier. Carriers requesting unique configurations for terminating their services to their collocation space will be charged on a case by case basis based on the actual cost of building the unique configuration.

Recurring Monthly Charge

There is also a small monthly recurring charge for maintaining these connections.

Cell: A10

Comment: 45-day installation is available only as required under contract provisions or in states where required by law.

Cell: A83

Comment: 1.2 Entrance Facility

Nonrecurring One Time Charge

Entrance facility is the connection between the CLEC cable outside the office *and the CLEC facilities within the office. The costs include the manhole* where the CLEC cable enters USWEST's facilities, the conduit between the manhole and the Central Office, the cable running from the manhole to the CLEC space and the structure, such as cable racking, used to support the cables. The placement costs for all the cable and equipment is also included. The cost is on a per fiber basis and must be ordered in quantities of 12 (the number of fibers in the standard cable). To place these cables the company has, in some instances, had to place new cable racking and new manholes to accommodate the CLEC's cable. The nonrecurring costs reflect the fact that a certain percentage of the time new facilities are required. These costs, when they are incurred, are spread over the number of CLEC's that are anticipated to use the facilities. The cable is also included in the nonrecurring charge since it is dedicated solely to the use of the requesting CLEC.

Recurring Monthly Charge

There is also a small recurring monthly charge for the cost using existing cable racking and other cable support facilities and the cost of maintaining all of the facilities used to provide this service to the CLEC.

Cell: A93

Comment: 1.3 Fiber Cable Splicing

The Fiber Cable Splicing elements represent the labor and equipment to perform a splice.

-The "Per Setup" element includes the labor required for an outside plant technician to perform all necessary tasks prior to the actual splicing and to install the splice case.

-The "Per Splice" element covers the labor to splice and test each fiber to each side of the splice case.

Cell: A97

Comment: 1.4 Power Usage

Recurring Monthly Charge

There are recurring monthly charges for power usage. Power usage includes the cost of purchasing power from the electric company and the cost of the power plant. Power usage is broken down into three rates:

1. A rate for the use of the power plant that is charged based on the size of the power feed of feeds that the CLEC orders;
2. A flat monthly power usage rate for each type of power feed that is smaller than 100 AMPs; and
3. A per AMP rate for power usage that is delivered on power feeds that are larger than 60 AMPs.

The power plant consists of the backup power generator, rectifiers, power boards, battery distribution frame boards (BDFB's), batteries and the cable and support structure that connects all these components. The power plant generates and stores power for use during potential outages converts standard AC power to the DC power used by telecommunications equipment and distributes the power to those areas of the central office where the power is to be used. The monthly charge reflects the capital and maintenance costs associated with maintaining this system. The monthly charge is based on the size of the power feed requested by the CLEC.

The usage charge for power consists of the cost of purchasing AC power from an external company. This charge will vary by actual amount of power used by a CLEC during a given period. Unfortunately for power feeds of less than 100 AMPs USWEST does not have the equipment at the BDFB to measure actual power usage. The cost of placing such measurement equipment would far exceed any benefits that could be obtained and would need to be recovered through an additional charge to the CLECs. For this reason, USWEST adopted an assumption that power usage on CLEC power feeds of less than 100 AMPs should be assumed to be 50 % of the actual capacity of the feed. For power cable of 100 AMPs or more the measurement capabilities currently exists so the charge for power will be based on actual usage.

Cell: A136
Comment: 1.5 Security
Provides for the security systems (e.g., card readers, identification cards, etc.) at USW wire centers so carriers can have access to their collocation space.

Cell: A140
Comment: 1.6 Composite Clock/CO Synchronization
This element provides Composite Clock and/or DS1 Synchronization signals traceable to a Stratum 1 source. The interconnector must determine the IDE synchronization requirements and notify US WEST of these requirements when ordering the clock signals. The Composite Clock signal is a 64 kHz, nominal 5/8 duty cycle, bipolar return-to-zero signal with a bipolar violation every eighth pulse. The DS1 Clock signal is a framed, all-ones, 1.544 Mb/s (DS1) signal using the superframe frame format and the Alternate Mark Inversion line code. CO Synchronization is required for VEIC Service involving digital services or connections. Synchronization may be required for analog services, depending on the IDE involved. CO Synchronization is available where US WEST wire centers are equipped with Building Integrated Timing Supply (BITS).

Cell: A143
Comment: 1.7 Interconnection Tie Pairs (ITP)
Recurring Monthly Charge
Interconnection Tie Pairs are the connection between the shared frame, where the terminations are tied, and the COSMIC frame. The cost of the ITP includes blocks on the shared frame, the shared frame, connections to the COSMIC frame and the cable and cable racking running between the shared frame and the COSMIC frame. The cost of placing all these facilities is also included in the overall costs. ITP's are part of the existing integrated USWEST network. Since these facilities will in most instances already exist and can be shared amongst various CLEC's and USWEST, the costs will be recovered through a monthly recurring charge based on the number of connections being used by any one CLEC during the period.

Cell: A148
Comment: Space Construction - General
Nonrecurring One Time Charge
At the request of CLECs, USWEST is offering a standard price for space construction. There are separate prices for standard caged and cageless collocation configurations. The standard costs for both cageless and caged collocation includes:

1. The costs for a single power feed;
2. The cost of new overhead structure to support cable racking and CLEC collocated equipment;
3. The cost of new cable racking required to carry the CLEC's power cable and terminations to the existing cable racking network;
4. The average cost of any new lighting that may be required to illuminate the CLEC's space;
5. The cost of engineering the collocation job; and
6. Additions to the cooling system (i.e. HVAC) and electromechanical system to extend the network to get incidental power and cooling to the CLECs collocation area.

The above costs although not identical for each type of collocation, are common to both caged and cageless collocation. The cost for common structure, such as cable racking, lighting and Arial support structure, is prorated between anticipated number of carriers that will be sharing the use of the structure. Facilities that are dedicated for the sole use of an individual CLEC, such as power cable, are assigned directly to that CLEC's job. The standard costs reflect the most opted for configurations. Adjustment factor s for costs for requested variations to the standard configurations are also identified for those companies seeking a different space design.

The engineering component of the standard configuration for both caged and cageless collocation includes all preliminary engineering costs that were incurred as a result of preparing the original quote. In some contracts there is a separate charge for this preliminary engineering that is assessed to the CLEC at the time that the quote is initiated. To the extent that the CLEC has paid a quote preparation fee that is nonrefundable and therefore retained by USWEST, the amount of that fee that is retained should be deducted from the standard space construction charge in determining the additional amount that that CLEC still owes to the company.

Cell: A150
Comment: 2.1 Space Construction-Cageless collocation
Standard Space Construction Charge
In addition to the facilities listed under Space Construction - General, the standard cageless collocation space construction charge includes the ground

cable for the CLEC's equipment. It also includes one standard 40 AMP power feed and a space adequate to insert two standard bays. The standard cost does not include the cost of the actual bays in which the CLEC places its equipment. These bays are self-provisioned by the CLEC. The standard space construction charge for cageless collocation varies between states based on whether they are located in an earthquake prone zone. Additional structural support is required in stated with a high risk of damage from earthquakes (i.e. Washington, Oregon, Utah, Arizona, Idaho, Wyoming and Montana). Two standard rates are calculated for cageless collocation to reflect these differences.

Some contracts contain provisions for constructing cageless collocation spaces within a 45-day time frame. This time frame is significantly less than the standard 90-day timeframe generally offered by the company. A forty-five day time frame eliminates many of the options the company has to reasonably forecast and plan for the additional workload. This results in an increase in the cost of the cost of constructing the facilities. To reflect this difference in cost in meeting these expedited timeframes a separate cageless collocation cost has been developed for these 45-day jobs. The CLEC also has the option of requesting a standard 90 day construction interval at a lower standard cost.

Cell: A151
Comment: 45-day installation is available only as reuired under contract provisions or in states where required by law.

Cell: A163
Comment: Power Feed-Variations to the Standard 40 AMP Feed Design

The standard cageless collocation rate includes the provisioning of one 40 AMP power feed. A CLEC can request a power feed to their cageless collocation space at 20, 30, 40 or 60 AMPS. USWEST has calculated cost based adjustments to the standard design price to facilitate pricing for power feed orders that vary from the standard 40 AMP design. For CLECs that order a 20 or 30 AMP cable the standard price is reduced to reflect the lower cost of these power feeds. The ordering of a 60 AMP cable would increase the standard space construction charge. These cost based adjustments to the standard design are included in the price list.

Cell: A166
Comment: Additional Bays

A CLEC also has the option of requesting space for additional bays. A cost for additional bays is included in the price list. This cost is based on a proration of the portion of the support structure; cable racking, lighting and grounding facilities needed to support the collocation area.

Cell: A167
Comment: Power Feed-Additional

Nonrecurring One Time Charge

This charge is for the DC power cable feeds from the CLEC equipment to the Battery Distribution Frame Board (i.e. BDFB) or Power Board, where the cable terminates. The power cable element included costs for the cables and the lugs, fuses and Htaps required to connect the cables to the power network. All costs of installing the cables are also included in the costs. These cables are attached directly to the CLEC's equipment and are dedicated exclusively for the use of the CLEC. One feed element consists of an A and B or original and backup feed. Each feed consists of two cables, four for the combined A & B feed. Power feeds can be purchased in the following sizes for the various types of collocation:

Size of Power Feed Type of Collocation

20 AMP Available for all types of Collocation
30 AMP Available for all types of Collocation
40 AMP Available for all types of Collocation
60 AMP Available for all types of Collocation
100 AMP Available for cage collocation only
200 AMP Available for cage collocation only
300 AMP Available for cage collocation only
400 AMP Available for cage collocation only

The costs for power feeds varies between the types of collocation (i. e. caged and cageless) due to the differences in the average distance between the CLEC space and the BDFB or power board. Power cables of 100 AMPs or greater are only available with caged collocation.

It should be noted that the initial power feed to a CLEC space is included in the initial space construction charge. The flat cageless collocation charge includes the cost of one 40 AMP cable. The flat Caged collocation costs includes the cost of one 60 AMP cable. There are also adjustments to the standard flat collocation space construction charge for CLECs that desire a power feed that varies from the standards identified above. The separate power feed charges only apply to the second and subsequent power feeds to the CLEC collocation space.

Recurring Monthly Charge

There is also a small recurring charge for the maintenance of the power feeds.

Cell: A182
Comment: 1.7.9 Space Rent

The monthly rent for the leased physical space, without -48 Volt DC Power. The base rent rate element includes one 110 AC, 15 AMP electrical outlet provided in accordance with local codes and may not be used to power transmission equipment or -48 Volt D

Cell: A186

Comment: 1.7.1 Quotation Preparation Fee

The non-recurring cost for preparing a price quotation to a collocator for collocation

Cell: A189

Comment: Space Construction-Caged collocation

3.1 Standard Space Construction Charge

In addition to the facilities listed under Space Construction - General, the standard cageless collocation space construction charge includes the cost of constructing the cage. *Cages are offered in standard 100, 200, 300 and 400 square feet increments. Nonstandard cage designs will be charged at the* next highest increment. The standard caged collocation rate also includes the provisioning of one standard 60 AMP power feed. In caged collocation the grounding cable is offered as a separate element so the cost of the ground cable is not included in the standard price. As discussed below, a CLEC has the option of ordering large power feeds for their caged collocation area. The larger power feeds the greater the size of the facilities required to ground the equipment. To accommodate these variances in the size of the ground wire that is required, a separate grounding element has been developed for caged collocation builds.

Cell: A195

Comment: Power Feed-Variations to the Standard 60 AMP Feed Design

The standard caged collocation rate includes the provisioning of one 60 AMP power feed. A CLEC can request a power feed to their caged collocation space at 20, 30, 40, 60, 100, 200, 300 and 400 AMPS. USWEST has calculated cost based adjustments to the standard design price to facilitate pricing for power feed orders that vary from the standard 60 AMP design. For CLECs that order a 20, 30 or 40 AMP power feeds the standard price is reduced to reflect the lower cost of these power feeds. The ordering of 100, 200, 300, and 400 AMP power feeds would increase the standard space construction charge. These cost based adjustments to the standard design are included in the price list.

Cell: A235

Comment: 3.2 Grounding

Extends the building DC ground from the grounding plane of the central office to the CLEC's space.

Cell: A258

Comment: 4.1 Equipment Bay/Shelf

The Equipment Bay provides mounting space for the interconnector-designated shelves and fuse panel. Each Bay includes the 7 foot bay, its installation and all necessary environmental supports (e.g., floor space, heat and lighting). Mounting space on the bay, including space for the fuse panel and air gaps necessary for heat dissipation, is limited to 78 inches. Physical dimensions of the equipment bay are 84 inches high by 26 inches wide by 12 inches deep. Each bay is capable of providing space for six shelves. This element is for space for one shelf on the equipment bay.

Cell: A261

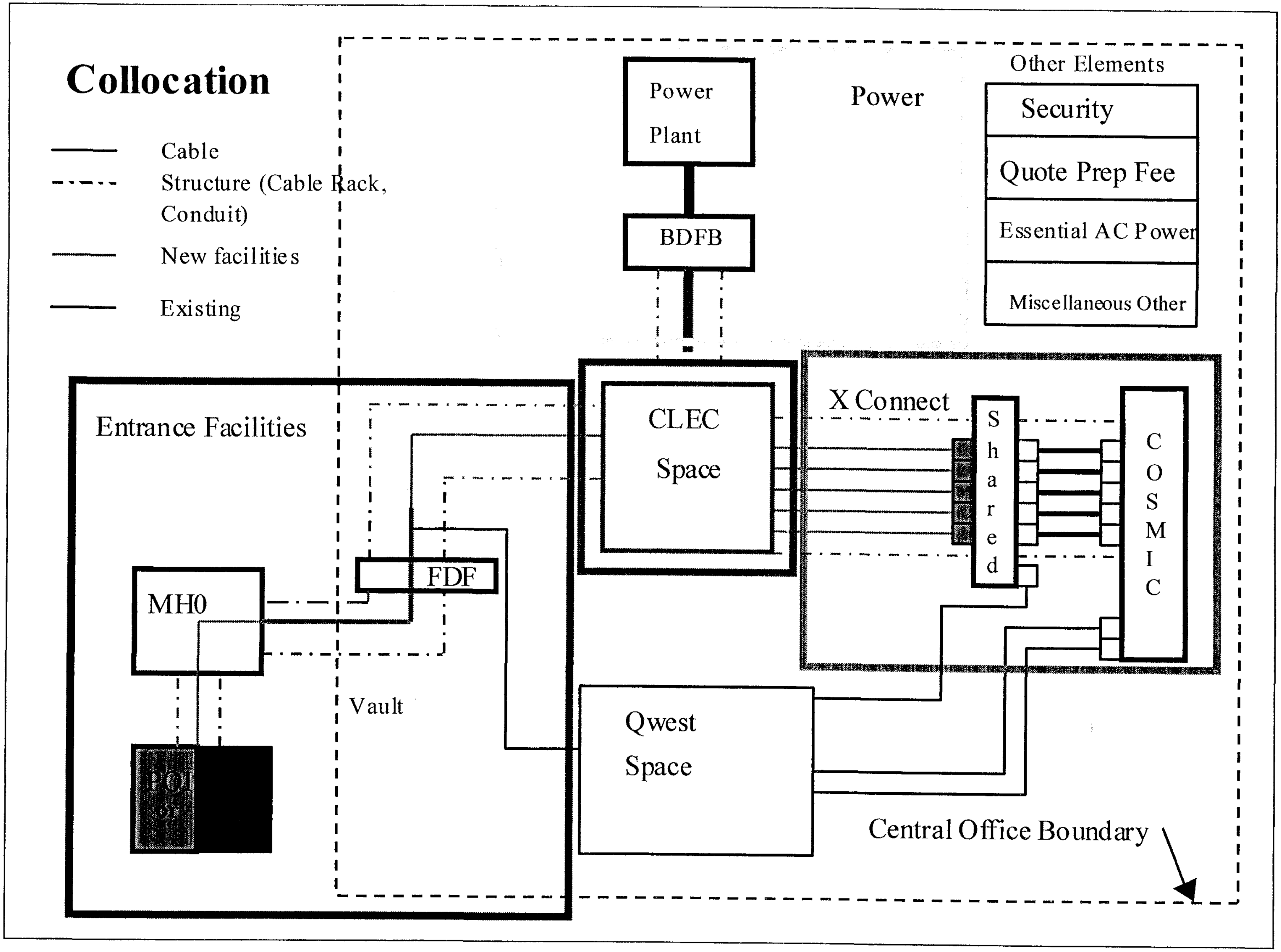
Comment: 4.2 Labor

- Equipment (Installation, Change, or Removal) - Labor - Equipment Labor is a charge associated with the installation, change or removal (i.e., discontinuance) of equipment. The Equipment Labor is a nonrecurring element based on the one half hour (1/2) during normal business hours or one half hour (1/2) outside normal business hours, as applicable.

- Equipment Maintenance - Labor - The Equipment Maintenance Labor rate element provides for the labor necessary to repair out-of-service and/or service-affecting conditions and preventative maintenance of the equipment as specified by the interconnector. The interconnector is responsible for ordering maintenance spares. USWC will perform maintenance and/or repair work upon receipt of the replacement maintenance spare and/or equipment from the applicable interconnector. The equipment maintenance labor charge is a nonrecurring charge assessed per one half hour (1/2) or fraction thereof, per technician, during normal business hours or per one half hour (1/2) or fraction thereof, per technician, outside normal business hours, as applicable. A call-out of a maintenance technician outside normal business hours is subject to a minimum charge of four (4) hours. If the technician is required beyond the four hour minimum, the remaining time will be billed at the half-hour increment charge.

- Training -The Training element provides for the billing of vendor-provided training for USWC personnel, on a metropolitan service area basis, necessary for interconnector-designated equipment (IDE) which is different from the USWC-provided equipment. USWC will require that three people be trained per metropolitan service area affected by the particular IDE. Within five business days of receiving the interconnector's request for service, USWC will inform the interconnector of the number of employees requiring training. If, by an act of USWC, the employees that have been trained are relocated, retired or are no longer available, USWC will not require an interconnector to provide training for any new employees for the same IDE.

The Training element will only apply as required and will be determined utilizing two elements: the first will be the actual number of hours that the employee(s) is in training and the second is the actual training charges direct billed to USWC (a copy of the invoice for the training course will be provided to the interconnector with the bill). The number of hours that the employee(s) is in training will be multiplied by the Labor rate element. The direct-billed training expenses will be billed to the interconnector in one half hour increments. The total direct-billed training expenses will be divided by the training element. The result of the division will be rounded to the nearest one-half hour increment.


Collocation
Cable
Structure (Cable Rack, Conduit)
New facilities
Existing
Power Plant
BDFB
Power
Other Elements
Security
Quote Prep Fee
Essential AC Power
Miscellaneous Other
Entrance Facilities
CLEC Space
X Connect
Shared
COSMIC
MH0
FDF
Vault
Qwest Space
Central Office Boundary

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

Row	Arizona	Source or Calculation	Factor Value (sF)	DS0 Cable Placement per 100 Pair Block - 90 Day	DS0 Cable Placement per Termination - 90 Day	DS0 Cable per 100 Pair Block - 90 Day	DS0 Cable per Termination - 90 Day	DS0 Blocks per 100 Pair Block - 90 Day	DS0 Blocks per Termination - 90 Day	DS0 Block Placement per 100 Pair Block - 90 Day	DS0 Block Placement per Terminatio n - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM			1.1.2 Terminations - 90 Day Installation							
							DS0 - 90 Day Installation				
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	sC p1-3 cK									
4	***Element Specific Expenses***	sE p1-2 cB-D		176.3326	3.3089	226.8223	3.1072	395.4844	5.4176	182.8860	2.5053
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		176.3326	3.3089	226.8223	3.1072	395.4844	5.4176	182.8860	2.5053
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	5.8509	0.1098	7.5262	0.1031	13.1226	0.1798	6.0684	0.0831
9	Sales Expense	cA*r5	0.01097	1.9342	0.0363	2.4881	0.0341	4.3382	0.0594	2.0061	0.0275
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.3285	0.0062	0.4226	0.0058	0.7369	0.0101	0.3408	0.0047
12	***Directly Assigned Costs***	***Sum r8:r11***		8.1137	0.1523	10.4369	0.1430	18.1977	0.2493	8.4152	0.1153
13											
14	***Total Direct***	***r5 + r12***		184.4463	3.4612	237.2592	3.2501	413.6820	5.6669	191.3012	2.6206
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	8.9560	0.1681	11.5204	0.1578	20.0869	0.2752	9.2889	0.1272
18	Network Support Assets	cA*r14	0.01559	2.8759	0.0540	3.6993	0.0507	6.4501	0.0884	2.9828	0.0409
19	General Support Assets	cA*r14	0.08364	15.4266	0.2895	19.8437	0.2718	34.5992	0.4740	15.9999	0.2192
20	General Purpose Computers	cA*r14	0.03562	6.5696	0.1233	8.4507	0.1158	14.7346	0.2018	6.8138	0.0933
21	Uncollectible - Interconnect	cA*r14	0.00098	0.1811	0.0034	0.2329	0.0032	0.4061	0.0056	0.1878	0.0026
22	Accounting and Finance Expense	cA*r14	0.00872	1.6090	0.0302	2.0697	0.0284	3.6087	0.0494	1.6688	0.0229
23	Human Resources Expense	cA*r14	0.00842	1.5535	0.0292	1.9983	0.0274	3.4842	0.0477	1.6112	0.0221
24	Information Management Expense	cA*r14	0.05980	11.0296	0.2070	14.1877	0.1944	24.7375	0.3389	11.4395	0.1567
25	Intangibles	cA*r14	0.00277	0.5110	0.0096	0.6573	0.0090	1.1461	0.0157	0.5300	0.0073
26	***Total Directly Attributed Costs***	***Sum r17:r25***		48.7122	0.9141	62.6601	0.8584	109.2533	1.4966	50.5226	0.6921
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		233.1585	4.3753	299.9193	4.1085	522.9354	7.1635	241.8239	3.3127
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	1.5667	0.0294	2.0153	0.0276	3.5138	0.0481	1.6249	0.0223
32	Planning Expense	cA*r28	0.00058	0.1349	0.0025	0.1735	0.0024	0.3026	0.0041	0.1399	0.0019
33	External Relations Expense	cA*r28	0.00949	2.2121	0.0415	2.8455	0.0390	4.9614	0.0680	2.2943	0.0314
34	Legal Expense	cA*r28	0.00621	1.4491	0.0272	1.8640	0.0255	3.2500	0.0445	1.5029	0.0206
35	Other Procurement Expense	cA*r28	0.00235	0.5484	0.0103	0.7054	0.0097	1.2300	0.0168	0.5688	0.0078
36	Research and Development Expense	cA*r28	0.00004	0.0084	0.0002	0.0108	0.0001	0.0188	0.0003	0.0087	0.0001
37	Other General and Admin Exp	cA*r28	0.01833	4.2728	0.0802	5.4962	0.0753	9.5831	0.1313	4.4316	0.0607
38	***Total Common Costs***	***Sum r31:r37***		10.1924	0.1913	13.1108	0.1796	22.8597	0.3131	10.5712	0.1448
39											
40	***TELRIC + Common***	***r28 + r38***		**243.35**	**4.57**	**313.03**	**4.29**	**545.80**	**7.48**	**252.40**	**3.46**

c = column, r = row, s = section, p = page

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

Row	Arizona	Source or Calculation	Factor Value (sF)	DS1 Cable Placement per 28 DS1s - 90 Day	DS1 Cable Placement per Termination - 90 Day	DS1 Cable per 28 DS1s - 90 Day	DS1 Cable per per Termination - 90 Day	DS1 Panel per 28 DS1s - 90 Day	DS1 Panel per Termination - 90 Day	DS1 Panel Placement per 28 DS1s - 90 Day	DS1 Panel Placement per Termination - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM										
				DS1 - 90 Day Installation							
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	**sC p1-3 cK**									
4	***Element Specific Expenses***	**sE p1-2 cB-D**		293.2814	31.5356	261.8595	28.1569	298.7937	36.0712	62.5800	6.7290
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		293.2814	31.5356	261.8595	28.1569	298.7937	36.0712	62.5800	6.7290
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	9.7314	1.0464	8.6888	0.9343	9.9143	1.1969	2.0765	0.2233
9	Sales Expense	cA*r5	0.01097	3.2171	0.3459	2.8724	0.3089	3.2776	0.3957	0.6865	0.0738
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.5464	0.0588	0.4879	0.0525	0.5567	0.0672	0.1166	0.0125
12	***Directly Assigned Costs***	***Sum r8:r11***		13.4949	1.4511	12.0491	1.2956	13.7486	1.6598	2.8795	0.3096
13											
14	***Total Direct***	*r5 + r12*		306.7763	32.9867	273.9086	29.4525	312.5422	37.7310	65.4595	7.0387
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	14.8959	1.6017	13.3000	1.4301	15.1759	1.8321	3.1785	0.3418
18	Network Support Assets	cA*r14	0.01559	4.7833	0.5143	4.2708	0.4592	4.8732	0.5883	1.0206	0.1097
19	General Support Assets	cA*r14	0.08364	25.6579	2.7589	22.9089	2.4633	26.1401	3.1557	5.4748	0.5887
20	General Purpose Computers	cA*r14	0.03562	10.9268	1.1749	9.7561	1.0490	11.1322	1.3439	2.3315	0.2507
21	Uncollectible - Interconnect	cA*r14	0.00098	0.3011	0.0324	0.2689	0.0289	0.3068	0.0370	0.0643	0.0069
22	Accounting and Finance Expense	cA*r14	0.00872	2.6761	0.2878	2.3894	0.2569	2.7264	0.3291	0.5710	0.0614
23	Human Resources Expense	cA*r14	0.00842	2.5838	0.2778	2.3070	0.2481	2.6324	0.3178	0.5513	0.0593
24	Information Management Expense	cA*r14	0.05980	18.3447	1.9725	16.3793	1.7612	18.6895	2.2562	3.9144	0.4209
25	Intangibles	cA*r14	0.00277	0.8499	0.0914	0.7589	0.0816	0.8659	0.1045	0.1814	0.0195
26	***Total Directly Attributed Costs***	***Sum r17:r25***		81.0196	8.7118	72.3392	7.7784	82.5423	9.9647	17.2878	1.8589
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		387.7959	41.6985	346.2478	37.2309	395.0846	47.6957	82.7474	8.8976
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	2.6058	0.2802	2.3266	0.2502	2.6548	0.3205	0.5560	0.0598
32	Planning Expense	cA*r28	0.00058	0.2244	0.0241	0.2004	0.0215	0.2286	0.0276	0.0479	0.0051
33	External Relations Expense	cA*r28	0.00949	3.6792	0.3956	3.2850	0.3532	3.7484	0.4525	0.7851	0.0844
34	Legal Expense	cA*r28	0.00621	2.4101	0.2592	2.1519	0.2314	2.4554	0.2964	0.5143	0.0553
35	Other Procurement Expense	cA*r28	0.00235	0.9121	0.0981	0.8144	0.0876	0.9293	0.1122	0.1946	0.0209
36	Research and Development Expense	cA*r28	0.00004	0.0139	0.0015	0.0124	0.0013	0.0142	0.0017	0.0030	0.0003
37	Other General and Admin Exp	cA*r28	0.01833	7.1066	0.7642	6.3452	0.6823	7.2402	0.8741	1.5164	0.1631
38	***Total Common Costs***	***Sum r31:r37***		16.9522	1.8228	15.1360	1.6275	17.2708	2.0850	3.6172	0.3890
39											
40	***TELRIC + Common***	***r28 + r38***		**404.75**	**43.52**	**361.38**	**38.86**	**412.36**	**49.78**	**86.36**	**9.29**

c = column, r = row, s = section, p = page

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

Row	Arizona	Source or Calculation	Factor Value (sF)	DS3 Cable Placement per Termination - 90 Day	DS3 Cable per Termination - 90 Day	DS3 Connector per Termination - 90 Day	DS3 Connector Placement per Termination - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM						
				DS3 - 90 Day Installation			
			A				
1	**Investment**	**sC p1-3 cE**					
2							
3	***Total Investment Based Costs***	**sC p1-3 cK**					
4	***Element Specific Expenses***	**sE p1-2 cB-D**		119.4070	169.0958	174.2277	17.9750
5	***Total IBC + Element Specific Expenses***	***r3 + r4***		119.4070	169.0958	174.2277	17.9750
6							
7	***Directly Assigned***						
8	Product Management Expense	cA*r5	0.03318	3.9621	5.6108	5.7811	0.5964
9	Sales Expense	cA*r5	0.01097	1.3098	1.8549	1.9112	0.1972
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.2225	0.3151	0.3246	0.0335
12	***Directly Assigned Costs***	***Sum r8:r11***		5.4943	7.7807	8.0168	0.8271
13							
14	***Total Direct***	***r5 + r12***		124.9013	176.8765	182.2445	18.8021
15							
16	***Directly Attributed***						
17	Network Operations	cA*r14	0.04856	6.0648	8.5885	8.8491	0.9130
18	Network Support Assets	cA*r14	0.01559	1.9475	2.7579	2.8416	0.2932
19	General Support Assets	cA*r14	0.08364	10.4464	14.7934	15.2424	1.5726
20	General Purpose Computers	cA*r14	0.03562	4.4487	6.3000	6.4912	0.6697
21	Uncollectible - Interconnect	cA*r14	0.00098	0.1226	0.1736	0.1789	0.0185
22	Accounting and Finance Expense	cA*r14	0.00872	1.0896	1.5430	1.5898	0.1640
23	Human Resources Expense	cA*r14	0.00842	1.0520	1.4897	1.5349	0.1584
24	Information Management Expense	cA*r14	0.05980	7.4689	10.5769	10.8979	1.1243
25	Intangibles	cA*r14	0.00277	0.3460	0.4900	0.5049	0.0521
26	***Total Directly Attributed Costs***	***Sum r17:r25***		32.9864	46.7130	48.1307	4.9656
27							
28	***Total Element Long Run Incremental C***	***r 14 + r26***		157.8877	223.5895	230.3753	23.7677
29							
30	***Common***						
31	Executive Expense	cA*r28	0.00672	1.0609	1.5024	1.5480	0.1597
32	Planning Expense	cA*r28	0.00058	0.0914	0.1294	0.1333	0.0138
33	External Relations Expense	cA*r28	0.00949	1.4980	2.1213	2.1857	0.2255
34	Legal Expense	cA*r28	0.00621	0.9813	1.3896	1.4318	0.1477
35	Other Procurement Expense	cA*r28	0.00235	0.3714	0.5259	0.5419	0.0559
36	Research and Development Expense	cA*r28	0.00004	0.0057	0.0080	0.0083	0.0009
37	Other General and Admin Exp	cA*r28	0.01833	2.8934	4.0974	4.2218	0.4356
38	***Total Common Costs***	***Sum r31:r37***		6.9019	9.7741	10.0707	1.0390
39							
40	***TELRIC + Common***	***r28 + r38***		**164.79**	**233.36**	**240.45**	**24.81**

c = column, r = row, s = section, p = page

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

Row	Arizona	Source or Calculation	Factor Value (sF)	DS0 Cable Placement per 100 pair per month	DS0 Cable Placement per Termination per month	DS0 Cable per 100 pair per month	DS0 Cable per Termination per month	DS0 Blocks per 100 pair per month	DS0 Blocks per Termination per month	DS0 Block Placement per 100 pair per month	DS0 Block Placement per Termination per month
	Version 1.0 Created 3/8/01, 12:59:26 PM			1.1.3 Terminations - Monthly Charge							
				DS0 - Monthly Charge							
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	**sC p1-3 cK**									
4	***Element Specific Expenses***	**sE p1-2 cB-D**		0.4131	0.0078	0.5314	0.0073	0.9265	0.0127	0.4284	0.0059
5	***Total IBC + Element Specific Expenses***	***r3 + r4***		0.4131	0.0078	0.5314	0.0073	0.9265	0.0127	0.4284	0.0059
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	0.0137	0.0003	0.0176	0.0002	0.0307	0.0004	0.0142	0.0002
9	Sales Expense	cA*r5	0.01097	0.0045	0.0001	0.0058	0.0001	0.0102	0.0001	0.0047	0.0001
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0008	0.0000	0.0010	0.0000	0.0017	0.0000	0.0008	0.0000
12	***Directly Assigned Costs***	***Sum r8:r11***		0.0190	0.0004	0.0245	0.0003	0.0426	0.0006	0.0197	0.0003
13											
14	***Total Direct***	***r5 + r12***		0.4321	0.0081	0.5558	0.0076	0.9691	0.0133	0.4482	0.0061
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	0.0210	0.0004	0.0270	0.0004	0.0471	0.0006	0.0218	0.0003
18	Network Support Assets	cA*r14	0.01559	0.0067	0.0001	0.0087	0.0001	0.0151	0.0002	0.0070	0.0001
19	General Support Assets	cA*r14	0.08364	0.0361	0.0007	0.0465	0.0006	0.0811	0.0011	0.0375	0.0005
20	General Purpose Computers	cA*r14	0.03562	0.0154	0.0003	0.0198	0.0003	0.0345	0.0005	0.0160	0.0002
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0004	0.0000	0.0005	0.0000	0.0010	0.0000	0.0004	0.0000
22	Accounting and Finance Expense	cA*r14	0.00872	0.0038	0.0001	0.0048	0.0001	0.0085	0.0001	0.0039	0.0001
23	Human Resources Expense	cA*r14	0.00842	0.0036	0.0001	0.0047	0.0001	0.0082	0.0001	0.0038	0.0001
24	Information Management Expense	cA*r14	0.05980	0.0258	0.0005	0.0332	0.0005	0.0580	0.0008	0.0268	0.0004
25	Intangibles	cA*r14	0.00277	0.0012	0.0000	0.0015	0.0000	0.0027	0.0000	0.0012	0.0000
26	***Total Directly Attributed Costs***	***Sum r17:r25***		0.1141	0.0021	0.1468	0.0020	0.2559	0.0035	0.1184	0.0016
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		0.5462	0.0102	0.7026	0.0096	1.2251	0.0168	0.5665	0.0078
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	0.0037	0.0001	0.0047	0.0001	0.0082	0.0001	0.0038	0.0001
32	Planning Expense	cA*r28	0.00058	0.0003	0.0000	0.0004	0.0000	0.0007	0.0000	0.0003	0.0000
33	External Relations Expense	cA*r28	0.00949	0.0052	0.0001	0.0067	0.0001	0.0116	0.0002	0.0054	0.0001
34	Legal Expense	cA*r28	0.00621	0.0034	0.0001	0.0044	0.0001	0.0076	0.0001	0.0035	0.0000
35	Other Procurement Expense	cA*r28	0.00235	0.0013	0.0000	0.0017	0.0000	0.0029	0.0000	0.0013	0.0000
36	Research and Development Expense	cA*r28	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	Other General and Admin Exp	cA*r28	0.01833	0.0100	0.0002	0.0129	0.0002	0.0225	0.0003	0.0104	0.0001
38	***Total Common Costs***	***Sum r31:r37***		0.0239	0.0004	0.0307	0.0004	0.0536	0.0007	0.0248	0.0003
39											
40	***TELRIC + Common***	***r28 + r38***		**0.5701**	**0.0107**	**0.7333**	**0.0100**	**1.2786**	**0.0175**	**0.5913**	**0.0081**

c = column, r = row, s = section, p = page

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

	Version 1.0 Created 3/8/01, 12:59:26 PM										
				DS1 - Monthly Charge							
Row	Arizona	Source or Calculation	Factor Value (sF)	DS1 Cable Placement per 28 DS1s per month	DS1 Cable Placement per Termination per month	DS1 Cable per 28 DS1s per month	DS1 Cable per per Termination per month	DS1 Panel per 28 DS1s per month	DS1 Panel per Termination per month	DS1 Panel Placement per 28 DS1s per month	DS1 Panel Placement per Termination per month
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	sC p1-3 cK									
4	***Element Specific Expenses***	sE p1-2 cB-D		0.5352	0.0575	0.4778	0.0514	0.5452	0.0658	0.1142	0.0123
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		0.5352	0.0575	0.4778	0.0514	0.5452	0.0658	0.1142	0.0123
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	0.0178	0.0019	0.0159	0.0017	0.0181	0.0022	0.0038	0.0004
9	Sales Expense	cA*r5	0.01097	0.0059	0.0006	0.0052	0.0006	0.0060	0.0007	0.0013	0.0001
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0010	0.0001	0.0009	0.0001	0.0010	0.0001	0.0002	0.0000
12	***Directly Assigned Costs***	***Sum r8:r11***		0.0246	0.0026	0.0220	0.0024	0.0251	0.0030	0.0053	0.0006
13											
14	***Total Direct***	***r5 + r12***		0.5598	0.0602	0.4998	0.0537	0.5703	0.0689	0.1194	0.0128
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	0.0272	0.0029	0.0243	0.0026	0.0277	0.0033	0.0058	0.0006
18	Network Support Assets	cA*r14	0.01559	0.0087	0.0009	0.0078	0.0008	0.0089	0.0011	0.0019	0.0002
19	General Support Assets	cA*r14	0.08364	0.0468	0.0050	0.0418	0.0045	0.0477	0.0058	0.0100	0.0011
20	General Purpose Computers	cA*r14	0.03562	0.0199	0.0021	0.0178	0.0019	0.0203	0.0025	0.0043	0.0005
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0005	0.0001	0.0005	0.0001	0.0006	0.0001	0.0001	0.0000
22	Accounting and Finance Expense	cA*r14	0.00872	0.0049	0.0005	0.0044	0.0005	0.0050	0.0006	0.0010	0.0001
23	Human Resources Expense	cA*r14	0.00842	0.0047	0.0005	0.0042	0.0005	0.0048	0.0006	0.0010	0.0001
24	Information Management Expense	cA*r14	0.05980	0.0335	0.0036	0.0299	0.0032	0.0341	0.0041	0.0071	0.0008
25	Intangibles	cA*r14	0.00277	0.0016	0.0002	0.0014	0.0001	0.0016	0.0002	0.0003	0.0000
26	***Total Directly Attributed Costs***	***Sum r17:r25***		0.1478	0.0159	0.1320	0.0142	0.1506	0.0182	0.0315	0.0034
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		0.7076	0.0761	0.6318	0.0679	0.7209	0.0870	0.1510	0.0162
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	0.0048	0.0005	0.0042	0.0005	0.0048	0.0006	0.0010	0.0001
32	Planning Expense	cA*r28	0.00058	0.0004	0.0000	0.0004	0.0000	0.0004	0.0001	0.0001	0.0000
33	External Relations Expense	cA*r28	0.00949	0.0067	0.0007	0.0060	0.0006	0.0068	0.0008	0.0014	0.0002
34	Legal Expense	cA*r28	0.00621	0.0044	0.0005	0.0039	0.0004	0.0045	0.0005	0.0009	0.0001
35	Other Procurement Expense	cA*r28	0.00235	0.0017	0.0002	0.0015	0.0002	0.0017	0.0002	0.0004	0.0000
36	Research and Development Expense	cA*r28	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	Other General and Admin Exp	cA*r28	0.01833	0.0130	0.0014	0.0116	0.0012	0.0132	0.0016	0.0028	0.0003
38	***Total Common Costs***	***Sum r31:r37***		0.0309	0.0033	0.0276	0.0030	0.0315	0.0038	0.0066	0.0007
39											
40	***TELRIC + Common***	***r28 + r38***		**0.7386**	**0.0794**	**0.6594**	**0.0709**	**0.7525**	**0.0908**	**0.1576**	**0.0169**

c = column, r = row, s = section, p = page

B. 1.1 Dev Total Prod Costs - Standard Collocation Terminations

Row	Arizona	Source or Calculation	Factor Value (sF)	DS3 Cable Placement per Termination per month	DS3 Cable per Termination per month	DS3 Connector per Termination per month	DS3 Connector Placement per Termination per month
	Version 1.0 Created 3/8/01, 12:59:26 PM			DS3 - Monthly Charge			
			A				
1	**Investment**	**sC p1-3 cE**					
2							
3	***Total Investment Based Costs***	sC p1-3 cK					
4	***Element Specific Expenses***	sE p1-2 cB-D		0.2179	0.3086	0.3179	0.0328
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		0.2179	0.3086	0.3179	0.0328
6							
7	***Directly Assigned***						
8	Product Management Expense	cA*r5	0.03318	0.0072	0.0102	0.0105	0.0011
9	Sales Expense	cA*r5	0.01097	0.0024	0.0034	0.0035	0.0004
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0004	0.0006	0.0006	0.0001
12	***Directly Assigned Costs***	*Sum r8:r11*		0.0100	0.0142	0.0146	0.0015
13							
14	***Total Direct***	*r5 + r12*		0.2279	0.3228	0.3326	0.0343
15							
16	***Directly Attributed***						
17	Network Operations	cA*r14	0.04856	0.0111	0.0157	0.0161	0.0017
18	Network Support Assets	cA*r14	0.01559	0.0036	0.0050	0.0052	0.0005
19	General Support Assets	cA*r14	0.08364	0.0191	0.0270	0.0278	0.0029
20	General Purpose Computers	cA*r14	0.03562	0.0081	0.0115	0.0118	0.0012
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0002	0.0003	0.0003	0.0000
22	Accounting and Finance Expense	cA*r14	0.00872	0.0020	0.0028	0.0029	0.0003
23	Human Resources Expense	cA*r14	0.00842	0.0019	0.0027	0.0028	0.0003
24	Information Management Expense	cA*r14	0.05980	0.0136	0.0193	0.0199	0.0021
25	Intangibles	cA*r14	0.00277	0.0006	0.0009	0.0009	0.0001
26	***Total Directly Attributed Costs***	*Sum r17:r25*		0.0602	0.0852	0.0878	0.0091
27							
28	***Total Element Long Run Incremental C***	***r 14 + r26***		**0.2881**	**0.4080**	**0.4204**	**0.0434**
29							
30	***Common***						
31	Executive Expense	cA*r28	0.00672	0.0019	0.0027	0.0028	0.0003
32	Planning Expense	cA*r28	0.00058	0.0002	0.0002	0.0002	0.0000
33	External Relations Expense	cA*r28	0.00949	0.0027	0.0039	0.0040	0.0004
34	Legal Expense	cA*r28	0.00621	0.0018	0.0025	0.0026	0.0003
35	Other Procurement Expense	cA*r28	0.00235	0.0007	0.0010	0.0010	0.0001
36	Research and Development Expense	cA*r28	0.00004	0.0000	0.0000	0.0000	0.0000
37	Other General and Admin Exp	cA*r28	0.01833	0.0053	0.0075	0.0077	0.0008
38	***Total Common Costs***	*Sum r31:r37*		0.0126	0.0178	0.0184	0.0019
39							
40	***TELRIC + Common***	*r28 + r38*		**0.3007**	**0.4258**	**0.4388**	**0.0453**

c = column, r = row, s = section, p = page

B. 1.2-1.3 Dev Total Prod Costs - Standard Collocation Entrance Facility and Cable Splicing

	Version 1.0 Created 3/8/01, 12:59:26 PM			1.2 Entrance Facility						1.3 Cable Splicing - 90 Day Installation	
				1.2.1 Entrance Facility - 90 Day Installation			1.2.2 Entrance Facility - Monthly Charge				
Row	Arizona	Source or Calculation	Factor Value (sF)	Standard Shared Per Fiber	Cross Connect per Fiber	Express per Cable	Standard Shared Per Fiber per month	Cross Connect per Fiber per month	Express per Cable per month	Setup	Per fiber Spliced
			A								
1	**Investment**	**sC p1-3 cE**					664.52	996.78	10882.64		
2											
3	***Total Investment Based Costs***	**sC p1-3 cK**					10.1441	15.2162	170.2966		
4	***Element Specific Expenses***	**sE p3 cC&E Sum of Accts**		893.3536	1201.4531	6364.2467	0.8488	1.2664	3.7955	344.0000	27.5000
5	***Total IBC + Element Specific Expenses***	***r3 + r4***		893.3536	1201.4531	6364.2467	10.9930	16.4826	174.0921	344.0000	27.5000
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	29.6425	39.8655	211.1727	0.3648	0.5469	5.7766	11.4143	0.9125
9	Sales Expense	cA*r5	0.01097	9.7995	13.1791	69.8113	0.1206	0.1808	1.9097	3.7734	0.3017
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	1.6645	2.2386	11.8580	0.0205	0.0307	0.3244	0.6409	0.0512
12	***Directly Assigned Costs***	***Sum r8:r11***		41.1064	55.2832	292.8420	0.5058	0.7584	8.0106	15.8287	1.2654
13											
14	***Total Direct***	***r5 + r12***		934.4601	1256.7363	6657.0886	11.4988	17.2410	182.1027	359.8287	28.7654
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	45.3740	61.0225	323.2440	0.5583	0.8372	8.8422	17.4720	1.3967
18	Network Support Assets	cA*r14	0.01559	14.5701	19.5950	103.7974	0.1793	0.2688	2.8393	5.6105	0.4485
19	General Support Assets	cA*r14	0.08364	78.1555	105.1098	556.7797	0.9617	1.4420	15.2305	30.0950	2.4059
20	General Purpose Computers	cA*r14	0.03562	33.2837	44.7625	237.1128	0.4096	0.6141	6.4861	12.8164	1.0246
21	Uncollectible - Interconnect	cA*r14	0.00098	0.9173	1.2336	6.5348	0.0113	0.0169	0.1788	0.3532	0.0282
22	Accounting and Finance Expense	cA*r14	0.00872	8.1516	10.9630	58.0722	0.1003	0.1504	1.5885	3.1389	0.2509
23	Human Resources Expense	cA*r14	0.00842	7.8704	10.5848	56.0690	0.0968	0.1452	1.5338	3.0306	0.2423
24	Information Management Expense	cA*r14	0.05980	55.8791	75.1507	398.0824	0.6876	1.0310	10.8894	21.5171	1.7201
25	Intangibles	cA*r14	0.00277	2.5889	3.4818	18.4434	0.0319	0.0478	0.5045	0.9969	0.0797
26	***Total Directly Attributed Costs***	***Sum r17:r25***		246.7907	331.9038	1758.1355	3.0368	4.5533	48.0933	95.0307	7.5969
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		1181.2507	1588.6401	8415.2241	14.5356	21.7943	230.1960	454.8593	36.3623
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	7.9374	10.6748	56.5458	0.0977	0.1464	1.5468	3.0564	0.2443
32	Planning Expense	cA*r28	0.00058	0.6835	0.9192	4.8693	0.0084	0.0126	0.1332	0.2632	0.0210
33	External Relations Expense	cA*r28	0.00949	11.2072	15.0723	79.8399	0.1379	0.2068	2.1840	4.3155	0.3450
34	Legal Expense	cA*r28	0.00621	7.3415	9.8734	52.3005	0.0903	0.1355	1.4307	2.8269	0.2260
35	Other Procurement Expense	cA*r28	0.00235	2.7784	3.7367	19.7936	0.0342	0.0513	0.5414	1.0699	0.0855
36	Research and Development Expense	cA*r28	0.00004	0.0424	0.0570	0.3021	0.0005	0.0008	0.0083	0.0163	0.0013
37	Other General and Admin Exp	cA*r28	0.01833	21.6471	29.1128	154.2141	0.2664	0.3994	4.2185	8.3356	0.6664
38	***Total Common Costs***	***Sum r31:r37***		51.6375	69.4462	367.8654	0.6354	0.9527	10.0628	19.8838	1.5896
39											
40	***TELRIC + Common***	***r28 + r38***		**1232.89**	**1658.09**	**8783.09**	**15.17**	**22.75**	**240.26**	**474.74**	**37.95**

c = column, r = row, s = section, p = page

B. 1.4 Dev Total Prod Costs - Standard Collocation Power Usage

Row	Arizona	Source or Calculation	Factor Value (sF)	Power Plant per Amp Ordered	Power Usage- Less than 60 AMPS per Amp Ordered	Power Usage- More than 60 AMPS per Amp Ordered	120 V per Amp per Month	208 V, Single Phase per Amp per Month	208 V, Three Phase per Amp per Month	240 V, Single Phase per Amp per Month	240 V, Three Phase per Amp per Month	480 V, Three Phase per Amp per Month
	Version 1.0 Created 3/8/01, 12:59:26 PM											
				1.4.1 Power Plant per Amp Ordered			1.4.2 Backup AC Power Feed Usage - Monthly Charges					
			A									
1	**Investment**	**sC p1-3 cE**		466.32			312.67	541.97	937.60	625.35	1081.85	2163.70
2												
3	***Total Investment Based Costs***	sC p1-3 cK		8.2327			5.5201	9.5681506	16.552901	11.0402	19.0995	38.1990
4	***Element Specific Expenses***	sE p3-4 cC-E			2.6712	5.3424	8.4359	14.6222	25.2963	16.8717	29.1881	58.3762
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		8.2327	2.6712	5.3424	13.9560	24.1903	41.8492	27.9119	48.2876	96.5752
6												
7	***Directly Assigned***											
8	Product Management Expense	cA*r5	0.03318	0.2732	0.0886	0.1773	0.4631	0.8027	1.3886	0.9261	1.6022	3.2045
9	Sales Expense	cA*r5	0.01097	0.0903	0.0293	0.0586	0.1531	0.2654	0.4591	0.3062	0.5297	1.0594
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0153	0.0050	0.0100	0.0260	0.0451	0.0780	0.0520	0.0900	0.1799
12	***Directly Assigned Costs***	*Sum r8:r11*		0.3788	0.1229	0.2458	0.6422	1.1131	1.9256	1.2843	2.2219	4.4438
13												
14	***Total Direct***	*r5 + r12*		8.6115	2.7941	5.5882	14.5981	25.3034	43.7749	29.1962	50.5095	101.0189
15												
16	***Directly Attributed***											
17	Network Operations	cA*r14	0.04856	0.4181	0.1357	0.2713	0.7088	1.2286	2.1255	1.4177	2.4526	4.9051
18	Network Support Assets	cA*r14	0.01559	0.1343	0.0436	0.0871	0.2276	0.3945	0.6825	0.4552	0.7875	1.5751
19	General Support Assets	cA*r14	0.08364	0.7202	0.2337	0.4674	1.2209	2.1163	3.6612	2.4419	4.2245	8.4489
20	General Purpose Computers	cA*r14	0.03562	0.3067	0.0995	0.1990	0.5200	0.9013	1.5592	1.0399	1.7991	3.5981
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0085	0.0027	0.0055	0.0143	0.0248	0.0430	0.0287	0.0496	0.0992
22	Accounting and Finance Expense	cA*r14	0.00872	0.0751	0.0244	0.0487	0.1273	0.2207	0.3819	0.2547	0.4406	0.8812
23	Human Resources Expense	cA*r14	0.00842	0.0725	0.0235	0.0471	0.1230	0.2131	0.3687	0.2459	0.4254	0.8508
24	Information Management Expense	cA*r14	0.05980	0.5150	0.1671	0.3342	0.8729	1.5131	2.6177	1.7459	3.0204	6.0408
25	Intangibles	cA*r14	0.00277	0.0239	0.0077	0.0155	0.0404	0.0701	0.1213	0.0809	0.1399	0.2799
26	***Total Directly Attributed Costs***	*Sum r17:r25*		2.2743	0.7379	1.4758	3.8554	6.6826	11.5609	7.7107	13.3395	26.6791
27												
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		10.8858	3.5320	7.0640	18.4535	31.9860	55.3358	36.9069	63.8490	127.6980
29												
30	***Common***											
31	Executive Expense	cA*r28	0.00672	0.0731	0.0237	0.0475	0.1240	0.2149	0.3718	0.2480	0.4290	0.8581
32	Planning Expense	cA*r28	0.00058	0.0063	0.0020	0.0041	0.0107	0.0185	0.0320	0.0214	0.0369	0.0739
33	External Relations Expense	cA*r28	0.00949	0.1033	0.0335	0.0670	0.1751	0.3035	0.5250	0.3502	0.6058	1.2115
34	Legal Expense	cA*r28	0.00621	0.0677	0.0220	0.0439	0.1147	0.1988	0.3439	0.2294	0.3968	0.7936
35	Other Procurement Expense	cA*r28	0.00235	0.0256	0.0083	0.0166	0.0434	0.0752	0.1302	0.0868	0.1502	0.3004
36	Research and Development Expense	cA*r28	0.00004	0.0004	0.0001	0.0003	0.0007	0.0011	0.0020	0.0013	0.0023	0.0046
37	Other General and Admin Exp	cA*r28	0.01833	0.1995	0.0647	0.1295	0.3382	0.5862	1.0141	0.6763	1.1701	2.3401
38	***Total Common Costs***	*Sum r31:r37*		0.4759	0.1544	0.3088	0.8067	1.3982	2.4190	1.6134	2.7911	5.5822
39												
40	***TELRIC + Common***	*r28 + r38*		11.3616	3.6864	7.3728	19.260	33.384	57.755	38.520	66.640	133.280

c = column, r = row, s = section, p = page

B. 1.4 Dev Total Prod Costs - Standard Collocation Power Usage

Row	Arizona	Source or Calculation	Factor Value (sF)	20 Amp, Single Phase - *Initial* Charge per Foot	20 Amp, Three Phase - *Initial* Charge per Foot	30 Amp, Single Phase - *Initial* Charge per Foot	30 Amp, Three Phase - *Initial* Charge per Foot	40 Amp, Single Phase - *Initial* Charge per Foot	40 Amp, Three Phase - *Initial* Charge per Foot	50 Amp, Single Phase - *Initial* Charge per Foot	50 Amp, Three Phase - *Initial* Charge per Foot	60 Amp, Single Phase - *Initial* Charge per Foot	60 Amp, Three Phase - *Initial* Charge per Foot	100 Amp, Single Phase - *Initial* Charge per Foot	100 Amp, Three Phase - *Initial* Charge per Foot
	Version 1.0 Created 3/8/01, 12:59:26 PM														
				1.4.3 Backup AC Power Cable - 90 Day Installation											
			A												
1	**Investment**	**sC p1-3 cE**													
2															
3	***Total Investment Based Costs***	sC p1-3 cK													
4	***Element Specific Expenses***	sE p3-4 cC-E		5.7827	7.1707	6.2362	8.5646	7.3332	10.0923	8.6992	12.1458	9.8366	13.9807	12.1795	19.0168
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		5.7827	7.1707	6.2362	8.5646	7.3332	10.0923	8.6992	12.1458	9.8366	13.9807	12.1795	19.0168
6															
7	***Directly Assigned***														
8	Product Management Expense	cA*r5	0.03318	0.1919	0.2379	0.2069	0.2842	0.2433	0.3349	0.2886	0.4030	0.3264	0.4639	0.4041	0.6310
9	Sales Expense	cA*r5	0.01097	0.0634	0.0787	0.0684	0.0939	0.0804	0.1107	0.0954	0.1332	0.1079	0.1534	0.1336	0.2086
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0108	0.0134	0.0116	0.0160	0.0137	0.0188	0.0162	0.0226	0.0183	0.0260	0.0227	0.0354
12	***Directly Assigned Costs***	***Sum r8:r11***		0.2661	0.3300	0.2870	0.3941	0.3374	0.4644	0.4003	0.5589	0.4526	0.6433	0.5604	0.8750
13															
14	***Total Direct***	*r5 + r12*		6.0487	7.5007	6.5232	8.9587	7.6707	10.5567	9.0994	12.7046	10.2892	14.6240	12.7399	19.8919
15															
16	***Directly Attributed***														
17	Network Operations	cA*r14	0.04856	0.2937	0.3642	0.3167	0.4350	0.3725	0.5126	0.4418	0.6169	0.4996	0.7101	0.6186	0.9659
18	Network Support Assets	cA*r14	0.01559	0.0943	0.1170	0.1017	0.1397	0.1196	0.1646	0.1419	0.1981	0.1604	0.2280	0.1986	0.3102
19	General Support Assets	cA*r14	0.08364	0.5059	0.6273	0.5456	0.7493	0.6416	0.8829	0.7611	1.0626	0.8606	1.2231	1.0655	1.6637
20	General Purpose Computers	cA*r14	0.03562	0.2154	0.2672	0.2323	0.3191	0.2732	0.3760	0.3241	0.4525	0.3665	0.5209	0.4538	0.7085
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0059	0.0074	0.0064	0.0088	0.0075	0.0104	0.0089	0.0125	0.0101	0.0144	0.0125	0.0195
22	Accounting and Finance Expense	cA*r14	0.00872	0.0528	0.0654	0.0569	0.0781	0.0669	0.0921	0.0794	0.1108	0.0898	0.1276	0.1111	0.1735
23	Human Resources Expense	cA*r14	0.00842	0.0509	0.0632	0.0549	0.0755	0.0646	0.0889	0.0766	0.1070	0.0867	0.1232	0.1073	0.1675
24	Information Management Expense	cA*r14	0.05980	0.3617	0.4485	0.3901	0.5357	0.4587	0.6313	0.5441	0.7597	0.6153	0.8745	0.7618	1.1895
25	Intangibles	cA*r14	0.00277	0.0168	0.0208	0.0181	0.0248	0.0213	0.0292	0.0252	0.0352	0.0285	0.0405	0.0353	0.0551
26	***Total Directly Attributed Costs***	***Sum r17:r25***		1.5975	1.9809	1.7228	2.3660	2.0258	2.7880	2.4032	3.3553	2.7174	3.8622	3.3646	5.2534
27															
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		7.6462	9.4816	8.2460	11.3246	9.6965	13.3447	11.5026	16.0599	13.0065	18.4862	16.1045	25.1453
29															
30	***Common***														
31	Executive Expense	cA*r28	0.00672	0.0514	0.0637	0.0554	0.0761	0.0652	0.0897	0.0773	0.1079	0.0874	0.1242	0.1082	0.1690
32	Planning Expense	cA*r28	0.00058	0.0044	0.0055	0.0048	0.0066	0.0056	0.0077	0.0067	0.0093	0.0075	0.0107	0.0093	0.0145
33	External Relations Expense	cA*r28	0.00949	0.0725	0.0900	0.0782	0.1074	0.0920	0.1266	0.1091	0.1524	0.1234	0.1754	0.1528	0.2386
34	Legal Expense	cA*r28	0.00621	0.0475	0.0589	0.0512	0.0704	0.0603	0.0829	0.0715	0.0998	0.0808	0.1149	0.1001	0.1563
35	Other Procurement Expense	cA*r28	0.00235	0.0180	0.0223	0.0194	0.0266	0.0228	0.0314	0.0271	0.0378	0.0306	0.0435	0.0379	0.0591
36	Research and Development Expense	cA*r28	0.00004	0.0003	0.0003	0.0003	0.0004	0.0003	0.0005	0.0004	0.0006	0.0005	0.0007	0.0006	0.0009
37	Other General and Admin Exp	cA*r28	0.01833	0.1401	0.1738	0.1511	0.2075	0.1777	0.2446	0.2108	0.2943	0.2384	0.3388	0.2951	0.4608
38	***Total Common Costs***	***Sum r31:r37***		0.3342	0.4145	0.3605	0.4950	0.4239	0.5834	0.5028	0.7020	0.5686	0.8081	0.7040	1.0992
39															
40	***TELRIC + Common***	*r28 + r38*		7.98	9.90	8.61	11.82	10.12	13.93	12.01	16.76	13.58	19.29	16.81	26.24

c = column, r = row, s = section, p = page

B. 1.4 Dev Total Prod Costs - Standard Collocation Power Usage

Row	Arizona	Source or Calculation	Factor Value (sF)	20 Amp, Single Phase per Foot per Month	20 Amp, Three Phase per Foot per Month	30 Amp, Single Phase per Foot per Month	30 Amp, Three Phase per Foot per Month	40 Amp, Single Phase per Foot per Month	40 Amp, Three Phase per Foot per Month	50 Amp, Single Phase per Foot per Month	50 Amp, Three Phase per Foot per Month	60 Amp, Single Phase per Foot per Month	60 Amp, Three Phase per Foot per Month	100 Amp, Single Phase per Foot per Month	100 Amp, Three Phase per Foot per Month
	Version 1.0 Created 3/8/01, 12:59:26 PM														
				1.4.4 Backup AC Power Cable - Monthly Charges											
			A												
1	**Investment**	sC p1-3 cE													
2															
3	***Total Investment Based Costs***	sC p1-3 cK													
4	***Element Specific Expenses***	sE p3-4 cC-E		0.0106	0.0131	0.0114	0.0156	0.0134	0.0184	0.0159	0.0222	0.0179	0.0255	0.0222	0.0347
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		0.0106	0.0131	0.0114	0.0156	0.0134	0.0184	0.0159	0.0222	0.0179	0.0255	0.0222	0.0347
6															
7	***Directly Assigned***														
8	Product Management Expense	cA*r5	0.03318	0.0004	0.0004	0.0004	0.0005	0.0004	0.0006	0.0005	0.0007	0.0006	0.0008	0.0007	0.0012
9	Sales Expense	cA*r5	0.01097	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0004
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
12	***Directly Assigned Costs***	*Sum r8:r11*		0.0005	0.0006	0.0005	0.0007	0.0006	0.0008	0.0007	0.0010	0.0008	0.0012	0.0010	0.0016
13															
14	***Total Direct***	*r5 + r12*		0.0110	0.0137	0.0119	0.0163	0.0140	0.0193	0.0166	0.0232	0.0188	0.0267	0.0232	0.0363
15															
16	***Directly Attributed***														
17	Network Operations	cA*r14	0.04856	0.0005	0.0007	0.0006	0.0008	0.0007	0.0009	0.0008	0.0011	0.0009	0.0013	0.0011	0.0018
18	Network Support Assets	cA*r14	0.01559	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0003	0.0004	0.0003	0.0004	0.0004	0.0006
19	General Support Assets	cA*r14	0.08364	0.0009	0.0011	0.0010	0.0014	0.0012	0.0016	0.0014	0.0019	0.0016	0.0022	0.0019	0.0030
20	General Purpose Computers	cA*r14	0.03562	0.0004	0.0005	0.0004	0.0006	0.0005	0.0007	0.0006	0.0008	0.0007	0.0010	0.0008	0.0013
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
22	Accounting and Finance Expense	cA*r14	0.00872	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003
23	Human Resources Expense	cA*r14	0.00842	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003
24	Information Management Expense	cA*r14	0.05980	0.0007	0.0008	0.0007	0.0010	0.0008	0.0012	0.0010	0.0014	0.0011	0.0016	0.0014	0.0022
25	Intangibles	cA*r14	0.00277	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001
26	***Total Directly Attributed Costs***	*Sum r17:r25*		0.0029	0.0036	0.0031	0.0043	0.0037	0.0051	0.0044	0.0061	0.0050	0.0070	0.0061	0.0096
27															
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		0.0140	0.0173	0.0150	0.0207	0.0177	0.0244	0.0210	0.0293	0.0237	0.0337	0.0294	0.0459
29															
30	***Common***														
31	Executive Expense	cA*r28	0.00672	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003
32	Planning Expense	cA*r28	0.00058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	External Relations Expense	cA*r28	0.00949	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0003	0.0004
34	Legal Expense	cA*r28	0.00621	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	0.0002	0.0003
35	Other Procurement Expense	cA*r28	0.00235	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001
36	Research and Development Expense	cA*r28	0.00004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	Other General and Admin Exp	cA*r28	0.01833	0.0003	0.0003	0.0003	0.0004	0.0003	0.0004	0.0004	0.0005	0.0004	0.0006	0.0005	0.0008
38	***Total Common Costs***	*Sum r31:r37*		0.0006	0.0008	0.0007	0.0009	0.0008	0.0011	0.0009	0.0013	0.0010	0.0015	0.0013	0.0020
39															
40	***TELRIC + Common***	*r28 + r38*		0.0146	0.0181	0.0157	0.0216	0.0185	0.0254	0.0219	0.0306	0.0248	0.0352	0.0307	0.0479

c = column, r = row, s = section, p = page

B. 1.5-1.7 Dev Total Prod Costs - Standard Collocation

	Version 1.0 Created 3/8/01, 12:59:26 PM								
				1.5 Security		1.6 Central office Clock Synchronization	1.7 Interconnection Tie Pair		
Row	Arizona	Source or Calculation	Factor Value (sF)	Access Card per Employee	Card Access Per Person per Office per Month	C O Clock Synchronization per Port	DS0 Per Connection	DS1 Per Connection	DS3 Per Connection
			A						
1	**Investment**	**sC p1-3 cE**		9.09	250.00	316.1968	20.5614	64.7905	653.29
2									
3	***Total Investment Based Costs***	sC p1-3 cK		0.2127	5.8508	5.5823	0.3659	1.1438	11.5336
4	***Element Specific Expenses***	sE p4 cD		0.4149					
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		0.6275	5.8508	5.5823	0.3659	1.1438	11.5336
6									
7	***Directly Assigned***								
8	Product Management Expense	cA*r5	0.03318	0.0208	0.1941	0.1852	0.0121	0.0380	0.3827
9	Sales Expense	cA*r5	0.01097	0.0069	0.0642	0.0612	0.0040	0.0125	0.1265
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0012	0.0109	0.0104	0.0007	0.0021	0.0215
12	***Directly Assigned Costs***	***Sum r8:r11***		0.0289	0.2692	0.2569	0.0168	0.0526	0.5307
13									
14	***Total Direct***	***r5 + r12***		0.6564	6.1200	5.8392	0.3828	1.1965	12.0643
15									
16	***Directly Attributed***								
17	Network Operations	cA*r14	0.04856	0.0319	0.2972	0.2835	0.0186	0.0581	0.5858
18	Network Support Assets	cA*r14	0.01559	0.0102	0.0954	0.0910	0.0060	0.0187	0.1881
19	General Support Assets	cA*r14	0.08364	0.0549	0.5119	0.4884	0.0320	0.1001	1.0090
20	General Purpose Computers	cA*r14	0.03562	0.0234	0.2180	0.2080	0.0136	0.0426	0.4297
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0006	0.0060	0.0057	0.0004	0.0012	0.0118
22	Accounting and Finance Expense	cA*r14	0.00872	0.0057	0.0534	0.0509	0.0033	0.0104	0.1052
23	Human Resources Expense	cA*r14	0.00842	0.0055	0.0515	0.0492	0.0032	0.0101	0.1016
24	Information Management Expense	cA*r14	0.05980	0.0393	0.3660	0.3492	0.0229	0.0715	0.7214
25	Intangibles	cA*r14	0.00277	0.0018	0.0170	0.0162	0.0011	0.0033	0.0334
26	***Total Directly Attributed Costs***	***Sum r17:r25***		0.1734	1.6163	1.5421	0.1011	0.3160	3.1862
27									
28	***Total Element Long Run Incremental C***	***r 14 + r26***		0.8298	7.7363	7.3813	0.4839	1.5125	15.2504
29									
30	***Common***								
31	Executive Expense	cA*r28	0.00672	0.0056	0.0520	0.0496	0.0033	0.0102	0.1025
32	Planning Expense	cA*r28	0.00058	0.0005	0.0045	0.0043	0.0003	0.0009	0.0088
33	External Relations Expense	cA*r28	0.00949	0.0079	0.0734	0.0700	0.0046	0.0143	0.1447
34	Legal Expense	cA*r28	0.00621	0.0052	0.0481	0.0459	0.0030	0.0094	0.0948
35	Other Procurement Expense	cA*r28	0.00235	0.0020	0.0182	0.0174	0.0011	0.0036	0.0359
36	Research and Development Expense	cA*r28	0.00004	0.0000	0.0003	0.0003	0.0000	0.0001	0.0005
37	Other General and Admin Exp	cA*r28	0.01833	0.0152	0.1418	0.1353	0.0089	0.0277	0.2795
38	***Total Common Costs***	***Sum r31:r37***		0.0363	0.3382	0.3227	0.0212	0.0661	0.6667
39									
40	***TELRIC + Common***	***r28 + r38***		0.8660	8.0744	7.7039	0.5050	1.5786	15.9171

B. 2 Dev Total Prod Costs - Cageless Collocation

Row	Arizona	Source or Calculation	Factor Value (sF)	Space Construction for 2 Bays and 1 - 40A Power Feed - 90 Day	Space Construction Adjustment for 20A Initial Power Feed - 90 Day	Space Construction Adjustment for 30A Initial Power Feed - 90 Day	Space Construction Adjustment for 60A Initial Power Feed - 90 Day	Space Construction Adjustment for Each Additional Bay 90 Day	Space Construction Adjustment for Each Additional 20A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 30A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 40A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 60A Power Feed - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM			2.1.2 Space Construction - 90 Day Installation								
			A									
1	**Investment**	**sC p1-3 cE**										
2												
3	***Total Investment Based Costs***	sC p1-3 cK										
4	***Element Specific Expenses***	sE p1-2 cB-D		21609.89	-1577.91	-1007.02	1382.41	2191.80	4005.94	4576.84	5583.85	6966.27
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		21609.89	-1577.91	-1007.02	1382.41	2191.80	4005.94	4576.84	5583.85	6966.27
6												
7	***Directly Assigned***											
8	Product Management Expense	cA*r5	0.03318	717.04	-52.36	-33.41	45.87	72.73	132.92	151.86	185.28	231.15
9	Sales Expense	cA*r5	0.01097	237.05	-17.31	-11.05	15.16	24.04	43.94	50.20	61.25	76.42
10	Product Advertising Expense	cA*r5	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	40.26	-2.94	-1.88	2.58	4.08	7.46	8.53	10.40	12.98
12	***Directly Assigned Costs***	*Sum r8:r11*		994.35	-72.61	-46.34	63.61	100.85	184.33	210.60	256.93	320.54
13												
14	***Total Direct***	*r5 + r12*		22604.24	-1650.52	-1053.35	1446.02	2292.65	4190.27	4787.44	5840.79	7286.81
15												
16	***Directly Attributed***											
17	Network Operations	cA*r14	0.04856	1097.58	-80.14	-51.15	70.21	111.32	203.46	232.46	283.61	353.82
18	Network Support Assets	cA*r14	0.01559	352.45	-25.73	-16.42	22.55	35.75	65.33	74.65	91.07	113.62
19	General Support Assets	cA*r14	0.08364	1890.55	-138.04	-88.10	120.94	191.75	350.46	400.41	488.51	609.45
20	General Purpose Computers	cA*r14	0.03562	805.12	-58.79	-37.52	51.50	81.66	149.25	170.52	208.04	259.54
21	Uncollectible - Interconnect	cA*r14	0.00098	22.19	-1.62	-1.03	1.42	2.25	4.11	4.70	5.73	7.15
22	Accounting and Finance Expense	cA*r14	0.00872	197.18	-14.40	-9.19	12.61	20.00	36.55	41.76	50.95	63.57
23	Human Resources Expense	cA*r14	0.00842	190.38	-13.90	-8.87	12.18	19.31	35.29	40.32	49.19	61.37
24	Information Management Expense	cA*r14	0.05980	1351.69	-98.70	-62.99	86.47	137.10	250.57	286.28	349.27	435.74
25	Intangibles	cA*r14	0.00277	62.62	-4.57	-2.92	4.01	6.35	11.61	13.26	16.18	20.19
26	***Total Directly Attributed Costs***	*Sum r17:r25*		5969.77	-435.90	-278.19	381.89	605.49	1106.65	1264.36	1542.55	1924.44
27												
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		28574.01	-2086.42	-1331.54	1827.92	2898.14	5296.92	6051.80	7383.34	9211.25
29												
30	***Common***											
31	Executive Expense	cA*r28	0.00672	192.00	-14.02	-8.95	12.28	19.47	35.59	40.66	49.61	61.89
32	Planning Expense	cA*r28	0.00058	16.53	-1.21	-0.77	1.06	1.68	3.06	3.50	4.27	5.33
33	External Relations Expense	cA*r28	0.00949	271.10	-19.79	-12.63	17.34	27.50	50.25	57.42	70.05	87.39
34	Legal Expense	cA*r28	0.00621	177.59	-12.97	-8.28	11.36	18.01	32.92	37.61	45.89	57.25
35	Other Procurement Expense	cA*r28	0.00235	67.21	-4.91	-3.13	4.30	6.82	12.46	14.23	17.37	21.67
36	Research and Development Expense	cA*r28	0.00004	1.03	-0.07	-0.05	0.07	0.10	0.19	0.22	0.27	0.33
37	Other General and Admin Exp	cA*r28	0.01833	523.64	-38.23	-24.40	33.50	53.11	97.07	110.90	135.30	168.80
38	***Total Common Costs***	***Sum r31:r37***		1249.09	-91.21	-58.21	79.91	126.69	231.55	264.55	322.76	402.66
39												
40	***TELRIC + Common***	*r28 + r38*		29823.10	-2177.62	-1389.75	1907.82	3024.83	5528.47	6316.35	7706.09	9613.92

c = column, r = row, s = section, p = page

B. 2 Dev Total Prod Costs - Cageless Collocation

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Row	Arizona	Source or Calculation	Factor Value (sF) A	2.1.3 Space Monthly Charge: Space Monthly Charge for 2 Bays and 1 - 40A Power Feed per Month	Space Monthly Charge Adjustment for 20A Initial Power Feed per Month	Space Monthly Charge Adjustment for 30A Initial Power Feed per Month	Space Monthly Charge Adjustment for 60A Initial Power Feed per Month	Space Monthly Charge Adjustment for Each Additional Bay per Month	Space Monthly Charge Adjustment for Each Additional 20A Power Feed per Month	Space Monthly Charge Adjustment for Each Additional 30A Power Feed per Month	Space Monthly Charge Adjustment for Each Additional 40A Power Feed per Month	Space Monthly Charge Adjustment for Each Additional 60A Power Feed per Month
1	**Investment**	**sC p1-3 cE**										
2												
3	***Total Investment Based Costs***	sC p1-3 cK										
4	***Element Specific Expenses***	sE p1-2 cB-D		39.4332	-2.8793	-1.8376	2.5226	3.9995	7.3099	8.3517	10.1893	12.7119
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		39.4332	-2.8793	-1.8376	2.5226	3.9995	7.3099	8.3517	10.1893	12.7119
6												
7	***Directly Assigned***											
8	Product Management Expense	cA*r5	0.03318	1.3084	-0.0955	-0.0610	0.0837	0.1327	0.2426	0.2771	0.3381	0.4218
9	Sales Expense	cA*r5	0.01097	0.4326	-0.0316	-0.0202	0.0277	0.0439	0.0802	0.0916	0.1118	0.1394
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0735	-0.0054	-0.0034	0.0047	0.0075	0.0136	0.0156	0.0190	0.0237
12	***Directly Assigned Costs***	*Sum r8:r11*		1.8145	-0.1325	-0.0846	0.1161	0.1840	0.3364	0.3843	0.4688	0.5849
13												
14	***Total Direct***	*r5 + r12*		41.2476	-3.0118	-1.9221	2.6387	4.1836	7.6463	8.7360	10.6581	13.2968
15												
16	***Directly Attributed***											
17	Network Operations	cA*r14	0.04856	2.0028	-0.1462	-0.0933	0.1281	0.2031	0.3713	0.4242	0.5175	0.6456
18	Network Support Assets	cA*r14	0.01559	0.6431	-0.0470	-0.0300	0.0411	0.0652	0.1192	0.1362	0.1662	0.2073
19	General Support Assets	cA*r14	0.08364	3.4498	-0.2519	-0.1608	0.2207	0.3499	0.6395	0.7307	0.8914	1.1121
20	General Purpose Computers	cA*r14	0.03562	1.4692	-0.1073	-0.0685	0.0940	0.1490	0.2723	0.3112	0.3796	0.4736
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0405	-0.0030	-0.0019	0.0026	0.0041	0.0075	0.0086	0.0105	0.0131
22	Accounting and Finance Expense	cA*r14	0.00872	0.3598	-0.0263	-0.0168	0.0230	0.0365	0.0667	0.0762	0.0930	0.1160
23	Human Resources Expense	cA*r14	0.00842	0.3474	-0.0254	-0.0162	0.0222	0.0352	0.0644	0.0736	0.0898	0.1120
24	Information Management Expense	cA*r14	0.05980	2.4665	-0.1801	-0.1149	0.1578	0.2502	0.4572	0.5224	0.6373	0.7951
25	Intangibles	cA*r14	0.00277	0.1143	-0.0083	-0.0053	0.0073	0.0116	0.0212	0.0242	0.0295	0.0368
26	***Total Directly Attributed Costs***	*Sum r17:r25*		10.8935	-0.7954	-0.5076	0.6969	1.1049	2.0194	2.3072	2.8148	3.5117
27												
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		52.1411	-3.8072	-2.4298	3.3355	5.2885	9.6657	11.0432	13.4729	16.8085
29												
30	***Common***											
31	Executive Expense	cA*r28	0.00672	0.3504	-0.0256	-0.0163	0.0224	0.0355	0.0649	0.0742	0.0905	0.1129
32	Planning Expense	cA*r28	0.00058	0.0302	-0.0022	-0.0014	0.0019	0.0031	0.0056	0.0064	0.0078	0.0097
33	External Relations Expense	cA*r28	0.00949	0.4947	-0.0361	-0.0231	0.0316	0.0502	0.0917	0.1048	0.1278	0.1595
34	Legal Expense	cA*r28	0.00621	0.3241	-0.0237	-0.0151	0.0207	0.0329	0.0601	0.0686	0.0837	0.1045
35	Other Procurement Expense	cA*r28	0.00235	0.1226	-0.0090	-0.0057	0.0078	0.0124	0.0227	0.0260	0.0317	0.0395
36	Research and Development Expense	cA*r28	0.00004	0.0019	-0.0001	-0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006
37	Other General and Admin Exp	cA*r28	0.01833	0.9555	-0.0698	-0.0445	0.0611	0.0969	0.1771	0.2024	0.2469	0.3080
38	***Total Common Costs***	*Sum r31:r37*		2.2793	-0.1664	-0.1062	0.1458	0.2312	0.4225	0.4827	0.5890	0.7348
39												
40	***TELRIC + Common***	*r28 + r38*		54.4205	-3.9737	-2.5360	3.4813	5.5196	10.0882	11.5259	14.0619	17.5432

c = column, r = row, s = section, p = page

B. 2 Dev Total Prod Costs - Cageless Collocation

	Version 1.0 Created 3/8/01, 12:59:26 PM				
				2.2 Rent	2.3 Quote Preparation Fee - Cageless Construction
Row	Arizona	Source or Calculation	Factor Value (sF)	Rent per Square Foot	Quotation Preparation Fee
			A		
1	**Investment**	**sC p1-3 cE**		**170.44**	
2					
3	***Total Investment Based Costs***	sC p1-3 cK		2.8713	
4	***Element Specific Expenses***	**sE p1-2 cB-D**			3174.25
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		2.8713	3174.25
6					
7	***Directly Assigned***				
8	Product Management Expense	cA*r5	0.03318	0.0953	105.33
9	Sales Expense	cA*r5	0.01097	0.0315	34.82
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0053	5.91
12	***Directly Assigned Costs***	*Sum r8:r11*		0.1321	146.06
13					
14	***Total Direct***	*r5 + r12*		3.0034	3320.31
15					
16	***Directly Attributed***				
17	Network Operations	cA*r14	0.04856	0.1458	161.22
18	Network Support Assets	cA*r14	0.01559	0.0468	51.77
19	General Support Assets	cA*r14	0.08364	0.2512	277.70
20	General Purpose Computers	cA*r14	0.03562	0.1070	118.26
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0029	3.26
22	Accounting and Finance Expense	cA*r14	0.00872	0.0262	28.96
23	Human Resources Expense	cA*r14	0.00842	0.0253	27.97
24	Information Management Expense	cA*r14	0.05980	0.1796	198.55
25	Intangibles	cA*r14	0.00277	0.0083	9.20
26	***Total Directly Attributed Costs***	*Sum r17:r25*		0.7932	876.89
27					
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		**3.7966**	**4197.20**
29					
30	***Common***				
31	Executive Expense	cA*r28	0.00672	0.0255	28.20
32	Planning Expense	cA*r28	0.00058	0.0022	2.43
33	External Relations Expense	cA*r28	0.00949	0.0360	39.82
34	Legal Expense	cA*r28	0.00621	0.0236	26.09
35	Other Procurement Expense	cA*r28	0.00235	0.0089	9.87
36	Research and Development Expense	cA*r28	0.00004	0.0001	0.15
37	Other General and Admin Exp	cA*r28	0.01833	0.0696	76.92
38	***Total Common Costs***	*Sum r31:r37*		0.1660	183.48
39					
40	***TELRIC + Common***	*r28 + r38*		**3.9625**	**4380.68**

c = column, r = row, s = section, p = page

B. 3.1 Dev Total Prod Costs - Caged Collocation Space Construction

Row	Arizona	Source or Calculation	Factor Value (sF)	Cage-Up to 100 Sq Ft - 90 Day	Cage-101 Sq Ft to 200 Sq Ft - 90 Day	Cage-201 Sq Ft to 300 Sq Ft - 90 Day	Cage-301 Sq Ft to 400 Sq Ft - 90 Day	Space Construction Adjustment for 20A Initial Power Feed - 90 Day	Space Construction Adjustment for 30A Initial Power Feed - 90 Day	Space Construction Adjustment for 40A Initial Power Feed - 90 Day	Space Construction Adjustment for 100A Initial Power Feed - 90 Day	Space Construction Adjustment for 200A Initial Power Feed - 90 Day	Space Construction Adjustment for 300A Initial Power Feed - 90 Day	Space Construction Adjustment for 400A Initial Power Feed - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM			3.1.1 Space Construction - 90 Day Installation				3.1.2 Initial Power Feed Adjustments - 90 Day						
			A											
1	**Investment**	sC p1-3 cE												
2														
3	***Total Investment Based Costs***	sC p1-3 cK												
4	***Element Specific Expenses***	sE p2 cC&D		37443.92	38855.92	39953.92	41329.92	-6118.90	-5570.73	-4424.70	6773.72	21625.01	39676.61	61025.67
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		37443.92	38855.92	39953.92	41329.92	-6118.90	-5570.73	-4424.70	6773.72	21625.01	39676.61	61025.67
6														
7	***Directly Assigned***													
8	Product Management Expense	cA*r5	0.03318	1242.43	1289.28	1325.71	1371.37	-203.03	-184.84	-146.82	224.76	717.54	1316.51	2024.90
9	Sales Expense	cA*r5	0.01097	410.73	426.22	438.27	453.36	-67.12	-61.11	-48.54	74.30	237.21	435.22	669.41
10	Product Advertising Expense	cA*r5	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	69.77	72.40	74.44	77.01	-11.40	-10.38	-8.24	12.62	40.29	73.93	113.70
12	***Directly Assigned Costs***	*Sum r8:r11*		1722.93	1787.90	1838.42	1901.74	-281.55	-256.33	-203.60	311.68	995.04	1825.66	2808.01
13														
14	***Total Direct***	*r5 + r12*		39166.85	40643.82	41792.35	43231.66	-6400.45	-5827.06	-4628.30	7085.40	22620.05	41502.27	63833.69
15														
16	***Directly Attributed***													
17	Network Operations	cA*r14	0.04856	1901.80	1973.52	2029.28	2099.17	-310.78	-282.94	-224.73	344.04	1098.35	2015.20	3099.53
18	Network Support Assets	cA*r14	0.01559	610.69	633.72	651.63	674.07	-99.80	-90.86	-72.16	110.48	352.69	647.10	995.30
19	General Support Assets	cA*r14	0.08364	3275.80	3399.33	3495.39	3615.77	-535.32	-487.36	-387.10	592.60	1891.88	3471.13	5338.87
20	General Purpose Computers	cA*r14	0.03562	1395.05	1447.66	1488.56	1539.83	-227.97	-207.55	-164.85	252.37	805.68	1478.23	2273.63
21	Uncollectible - Interconnect	cA*r14	0.00098	38.45	39.90	41.02	42.44	-6.28	-5.72	-4.54	6.96	22.20	40.74	62.66
22	Accounting and Finance Expense	cA*r14	0.00872	341.67	354.55	364.57	377.13	-55.83	-50.83	-40.37	61.81	197.32	362.04	556.84
23	Human Resources Expense	cA*r14	0.00842	329.88	342.32	351.99	364.12	-53.91	-49.08	-38.98	59.68	190.52	349.55	537.64
24	Information Management Expense	cA*r14	0.05980	2342.11	2430.43	2499.11	2585.18	-382.74	-348.45	-276.76	423.69	1352.64	2481.76	3817.14
25	Intangibles	cA*r14	0.00277	108.51	112.60	115.79	119.77	-17.73	-16.14	-12.82	19.63	62.67	114.98	176.85
26	***Total Directly Attributed Costs***	*Sum r17:r25*		10343.96	10734.02	11037.35	11417.47	-1690.36	-1538.92	-1222.33	1871.25	5973.95	10960.74	16858.46
27														
28	***Total Element Long Run Incremental C***	*r 14 + r26*		49510.81	51377.85	52829.69	54649.13	-8090.81	-7365.98	-5850.63	8956.66	28594.00	52463.01	80692.15
29														
30	***Common***													
31	Executive Expense	cA*r28	0.00672	332.69	345.23	354.99	367.21	-54.37	-49.50	-39.31	60.18	192.14	352.52	542.21
32	Planning Expense	cA*r28	0.00058	28.65	29.73	30.57	31.62	-4.68	-4.26	-3.39	5.18	16.55	30.36	46.69
33	External Relations Expense	cA*r28	0.00949	469.74	487.45	501.22	518.49	-76.76	-69.89	-55.51	84.98	271.29	497.75	765.57
34	Legal Expense	cA*r28	0.00621	307.71	319.31	328.34	339.64	-50.28	-45.78	-36.36	55.67	177.71	326.06	501.50
35	Other Procurement Expense	cA*r28	0.00235	116.46	120.85	124.26	128.54	-19.03	-17.33	-13.76	21.07	67.26	123.40	189.80
36	Research and Development Expense	cA*r28	0.00004	1.78	1.84	1.90	1.96	-0.29	-0.26	-0.21	0.32	1.03	1.88	2.90
37	Other General and Admin Exp	cA*r28	0.01833	907.32	941.53	968.14	1001.48	-148.27	-134.99	-107.22	164.14	524.00	961.42	1478.73
38	***Total Common Costs***	*Sum r31:r37*		2164.33	2245.94	2309.41	2388.95	-353.68	-322.00	-255.76	391.53	1249.97	2293.38	3527.40
39														
40	***TELRIC + Common***	*r28 + r38*		**51675.14**	**53623.79**	**55139.10**	**57038.08**	**-8444.49**	**-7687.98**	**-6106.39**	**9348.19**	**29843.97**	**54756.39**	**84219.54**

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B. 3.1 Dev Total Prod Costs - Caged Collocation Space Construction

Row	Arizona	Source or Calculation	Factor Value (sF)	Space Construction Adjustment for Each Additional 20A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 30A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 40A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 60A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 100A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 200A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 300A Power Feed - 90 Day	Space Construction Adjustment for Each Additional 400A Power Feed - 90 Day
	Version 1.0 Created 3/8/01, 12:59:26 PM										
				3.1.3 Each Additional Power Feed Adjustments - 90 Day							
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	**sC p1-3 cK**									
4	***Element Specific Expenses***	**sE p2 cC&D**		5053.27	5601.44	6747.46	11172.17	17945.89	32797.17	50848.77	72197.84
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		5053.27	5601.44	6747.46	11172.17	17945.89	32797.17	50848.77	72197.84
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	167.67	185.86	223.89	370.70	595.46	1088.25	1687.22	2395.60
9	Sales Expense	cA*r5	0.01097	55.43	61.44	74.01	122.55	196.85	359.76	557.78	791.96
10	Product Advertising Expense	cA*r5	0.00000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	9.42	10.44	12.57	20.82	33.44	61.11	94.74	134.52
12	***Directly Assigned Costs***	***Sum r8:r11***		232.52	257.74	310.48	514.07	825.76	1509.12	2339.74	3322.08
13											
14	***Total Direct***	***r5 + r12***		5285.79	5859.18	7057.94	11686.24	18771.64	34306.29	53188.51	75519.92
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	256.66	284.50	342.71	567.44	911.48	1665.79	2582.64	3666.97
18	Network Support Assets	cA*r14	0.01559	82.42	91.36	110.05	182.21	292.69	534.90	829.32	1177.51
19	General Support Assets	cA*r14	0.08364	442.09	490.04	590.31	977.40	1570.01	2869.28	4448.53	6316.27
20	General Purpose Computers	cA*r14	0.03562	188.27	208.69	251.39	416.24	668.61	1221.92	1894.47	2689.88
21	Uncollectible - Interconnect	cA*r14	0.00098	5.19	5.75	6.93	11.47	18.43	33.68	52.21	74.13
22	Accounting and Finance Expense	cA*r14	0.00872	46.11	51.11	61.57	101.94	163.75	299.27	463.98	658.79
23	Human Resources Expense	cA*r14	0.00842	44.52	49.35	59.45	98.43	158.10	288.94	447.98	636.06
24	Information Management Expense	cA*r14	0.05980	316.08	350.37	422.05	698.82	1122.51	2051.46	3180.58	4515.96
25	Intangibles	cA*r14	0.00277	14.64	16.23	19.55	32.38	52.01	95.05	147.36	209.23
26	***Total Directly Attributed Costs***	***Sum r17:r25***		1395.98	1547.41	1864.00	3086.33	4957.59	9060.28	14047.07	19944.79
27											
28	***Total Element Long Run Incremental C***	***r 14 + r26***		6681.77	7406.59	8921.94	14772.57	23729.23	43366.57	67235.58	95464.72
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	44.90	49.77	59.95	99.26	159.45	291.40	451.79	641.47
32	Planning Expense	cA*r28	0.00058	3.87	4.29	5.16	8.55	13.73	25.09	38.90	55.24
33	External Relations Expense	cA*r28	0.00949	63.39	70.27	84.65	140.16	225.13	411.44	637.90	905.73
34	Legal Expense	cA*r28	0.00621	41.53	46.03	55.45	91.81	147.48	269.52	417.87	593.31
35	Other Procurement Expense	cA*r28	0.00235	15.72	17.42	20.99	34.75	55.81	102.00	158.15	224.54
36	Research and Development Expense	cA*r28	0.00004	0.24	0.27	0.32	0.53	0.85	1.56	2.41	3.43
37	Other General and Admin Exp	cA*r28	0.01833	122.45	135.73	163.50	270.72	434.85	794.72	1232.13	1749.45
38	***Total Common Costs***	***Sum r31:r37***		292.09	323.77	390.02	645.77	1037.31	1895.74	2939.15	4173.17
39											
40	***TELRIC + Common***	***r28 + r38***		**6973.86**	**7730.36**	**9311.95**	**15418.34**	**24766.54**	**45262.31**	**70174.74**	**99637.89**

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B. 3.1 Dev Total Prod Costs - Caged Collocation Space Construction

Row	Version 1.0 Created 3/8/01, 12:59:26 PM													
				3.1.4 Space Monthly Charge				3.1.5 Initial Power Feed Monthly Charge Adjustments						
Row	Arizona	Source or Calculation	Factor Value (sF)	Cage-Up to 100 Sq Ft Monthly Charge	Cage-101 Sq Ft to 200 Sq Ft Monthly Charge	Cage-201 Sq Ft to 300 Sq Ft Monthly Charge	Cage-301 Sq Ft to 400 Sq Ft Monthly Charge	Space Monthly Charge Adjustment for 20A Initial Power Feed	Space Monthly Charge Adjustment for 30A Initial Power Feed	Space Monthly Charge Adjustment for 40A Initial Power Feed	Space Monthly Charge Adjustment for 100A Initial Power Feed	Space Monthly Charge Adjustment for 200A Initial Power Feed	Space Monthly Charge Adjustment for 300A Initial Power Feed	Space Monthly Charge Adjustment for 400A Initial Power Feed
			A											
1	**Investment**	**sC p1-3 cE**												
2														
3	***Total Investment Based Costs***	**sC p1-3 cK**												
4	***Element Specific Expenses***	**sE p2 cC&D**		68.3267	70.9033	72.9069	75.4178	-11.1656	-10.1653	-8.0741	12.3605	39.4608	72.4009	111.3581
5	***Total IBC + Element Specific Expenses***	***r3 + r4***		68.3267	70.9033	72.9069	75.4178	-11.1656	-10.1653	-8.0741	12.3605	39.4608	72.4009	111.3581
6														
7	***Directly Assigned***													
8	Product Management Expense	cA*r5	0.03318	2.2672	2.3526	2.4191	2.5024	-0.3705	-0.3373	-0.2679	0.4101	1.3094	2.4023	3.6950
9	Sales Expense	cA*r5	0.01097	0.7495	0.7778	0.7997	0.8273	-0.1225	-0.1115	-0.0886	0.1356	0.4329	0.7942	1.2215
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.1273	0.1321	0.1358	0.1405	-0.0208	-0.0189	-0.0150	0.0230	0.0735	0.1349	0.2075
12	***Directly Assigned Costs***	***Sum r8:r11***		3.1440	3.2625	3.3547	3.4702	-0.5138	-0.4677	-0.3715	0.5688	1.8157	3.3314	5.1240
13														
14	***Total Direct***	***r5 + r12***		71.4707	74.1658	76.2616	78.8880	-11.6794	-10.6331	-8.4456	12.9293	41.2765	75.7323	116.4821
15														
16	***Directly Attributed***													
17	Network Operations	cA*r14	0.04856	3.4704	3.6012	3.7030	3.8305	-0.5671	-0.5163	-0.4101	0.6278	2.0042	3.6773	5.6559
18	Network Support Assets	cA*r14	0.01559	1.1144	1.1564	1.1891	1.2300	-0.1821	-0.1658	-0.1317	0.2016	0.6436	1.1808	1.8162
19	General Support Assets	cA*r14	0.08364	5.9776	6.2030	6.3783	6.5980	-0.9768	-0.8893	-0.7064	1.0814	3.4522	6.3340	9.7422
20	General Purpose Computers	cA*r14	0.03562	2.5456	2.6416	2.7163	2.8098	-0.4160	-0.3787	-0.3008	0.4605	1.4702	2.6974	4.1489
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0702	0.0728	0.0749	0.0774	-0.0115	-0.0104	-0.0083	0.0127	0.0405	0.0743	0.1143
22	Accounting and Finance Expense	cA*r14	0.00872	0.6235	0.6470	0.6653	0.6882	-0.1019	-0.0928	-0.0737	0.1128	0.3601	0.6606	1.0161
23	Human Resources Expense	cA*r14	0.00842	0.6020	0.6247	0.6423	0.6644	-0.0984	-0.0896	-0.0711	0.1089	0.3476	0.6379	0.9811
24	Information Management Expense	cA*r14	0.05980	4.2738	4.4350	4.5603	4.7174	-0.6984	-0.6358	-0.5050	0.7731	2.4683	4.5287	6.9654
25	Intangibles	cA*r14	0.00277	0.1980	0.2055	0.2113	0.2186	-0.0324	-0.0295	-0.0234	0.0358	0.1144	0.2098	0.3227
26	***Total Directly Attributed Costs***	***Sum r17:r25***		18.8754	19.5872	20.1407	20.8343	-3.0845	-2.8082	-2.2305	3.4146	10.9011	20.0009	30.7629
27														
28	***Total Element Long Run Incremental C***	***r14 + r26***		90.3461	93.7530	96.4023	99.7224	-14.7639	-13.4413	-10.6761	16.3439	52.1776	95.7332	147.2450
29														
30	***Common***													
31	Executive Expense	cA*r28	0.00672	0.6071	0.6300	0.6478	0.6701	-0.0992	-0.0903	-0.0717	0.1098	0.3506	0.6433	0.9894
32	Planning Expense	cA*r28	0.00058	0.0523	0.0542	0.0558	0.0577	-0.0085	-0.0078	-0.0062	0.0095	0.0302	0.0554	0.0852
33	External Relations Expense	cA*r28	0.00949	0.8572	0.8895	0.9146	0.9461	-0.1401	-0.1275	-0.1013	0.1551	0.4950	0.9083	1.3970
34	Legal Expense	cA*r28	0.00621	0.5615	0.5827	0.5991	0.6198	-0.0918	-0.0835	-0.0664	0.1016	0.3243	0.5950	0.9151
35	Other Procurement Expense	cA*r28	0.00235	0.2125	0.2205	0.2267	0.2346	-0.0347	-0.0316	-0.0251	0.0384	0.1227	0.2252	0.3463
36	Research and Development Expense	cA*r28	0.00004	0.0032	0.0034	0.0035	0.0036	-0.0005	-0.0005	-0.0004	0.0006	0.0019	0.0034	0.0053
37	Other General and Admin Exp	cA*r28	0.01833	1.6556	1.7181	1.7666	1.8275	-0.2706	-0.2463	-0.1956	0.2995	0.9562	1.7544	2.6984
38	***Total Common Costs***	***Sum r31:r37***		3.9494	4.0983	4.2142	4.3593	-0.6454	-0.5876	-0.4667	0.7145	2.2809	4.1849	6.4367
39														
40	***TELRIC + Common***	***r28 + r38***		**94.30**	**97.85**	**100.62**	**104.08**	**-15.41**	**-14.03**	**-11.14**	**17.06**	**54.46**	**99.92**	**153.68**

c = column, r = row, s = section, p = page

B. 3.1 Dev Total Prod Costs - Caged Collocation Space Construction

Row	Arizona	Source or Calculation	Factor Value (sF)	Space Monthly Charge Adjustment for Each Additional 20A Power Feed	Space Monthly Charge Adjustment for Each Additional 30A Power Feed	Space Monthly Charge Adjustment for Each Additional 40A Power Feed	Space Monthly Charge Adjustment for Each Additional 60A Power Feed	Space Monthly Charge Adjustment for Each Additional 100A Power Feed	Space Monthly Charge Adjustment for Each Additional 200A Power Feed	Space Monthly Charge Adjustment for Each Additional 300A Power Feed	Space Monthly Charge Adjustment for Each Additional 400A Power Feed
	Version 1.0 Created 3/8/01, 12:59:26 PM			3.1.6 Each Additional Power Feed Monthly Charge Adjustments							
			A								
1	**Investment**	**sC p1-3 cE**									
2											
3	***Total Investment Based Costs***	**sC p1-3 cK**									
4	***Element Specific Expenses***	**sE p2 cC&D**		9.2211	10.2214	12.3126	20.3867	32.7472	59.8475	92.7876	131.7448
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		9.2211	10.2214	12.3126	20.3867	32.7472	59.8475	92.7876	131.7448
6											
7	***Directly Assigned***										
8	Product Management Expense	cA*r5	0.03318	0.3060	0.3392	0.4085	0.6765	1.0866	1.9858	3.0788	4.3714
9	Sales Expense	cA*r5	0.01097	0.1011	0.1121	0.1351	0.2236	0.3592	0.6565	1.0178	1.4451
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0172	0.0190	0.0229	0.0380	0.0610	0.1115	0.1729	0.2455
12	***Directly Assigned Costs***	***Sum r8:r11***		0.4243	0.4703	0.5665	0.9381	1.5068	2.7538	4.2695	6.0621
13											
14	***Total Direct***	***r5 + r12***		9.6454	10.6917	12.8791	21.3248	34.2540	62.6013	97.0571	137.8069
15											
16	***Directly Attributed***										
17	Network Operations	cA*r14	0.04856	0.4683	0.5191	0.6254	1.0355	1.6633	3.0397	4.7127	6.6914
18	Network Support Assets	cA*r14	0.01559	0.1504	0.1667	0.2008	0.3325	0.5341	0.9761	1.5133	2.1487
19	General Support Assets	cA*r14	0.08364	0.8067	0.8942	1.0772	1.7835	2.8649	5.2358	8.1176	11.5258
20	General Purpose Computers	cA*r14	0.03562	0.3435	0.3808	0.4587	0.7595	1.2201	2.2297	3.4570	4.9084
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0095	0.0105	0.0126	0.0209	0.0336	0.0615	0.0953	0.1353
22	Accounting and Finance Expense	cA*r14	0.00872	0.0841	0.0933	0.1123	0.1860	0.2988	0.5461	0.8467	1.2021
23	Human Resources Expense	cA*r14	0.00842	0.0812	0.0901	0.1085	0.1796	0.2885	0.5273	0.8175	1.1607
24	Information Management Expense	cA*r14	0.05980	0.5768	0.6393	0.7702	1.2752	2.0483	3.7434	5.8038	8.2406
25	Intangibles	cA*r14	0.00277	0.0267	0.0296	0.0357	0.0591	0.0949	0.1734	0.2689	0.3818
26	***Total Directly Attributed Costs***	***Sum r17:r25***		2.5473	2.8237	3.4014	5.6319	9.0465	16.5330	25.6327	36.3948
27											
28	***Total Element Long Run Incremental C***	***r14 + r26***		12.1927	13.5154	16.2805	26.9566	43.3005	79.1342	122.6898	174.2016
29											
30	***Common***										
31	Executive Expense	cA*r28	0.00672	0.0819	0.0908	0.1094	0.1811	0.2910	0.5317	0.8244	1.1705
32	Planning Expense	cA*r28	0.00058	0.0071	0.0078	0.0094	0.0156	0.0251	0.0458	0.0710	0.1008
33	External Relations Expense	cA*r28	0.00949	0.1157	0.1282	0.1545	0.2558	0.4108	0.7508	1.1640	1.6527
34	Legal Expense	cA*r28	0.00621	0.0758	0.0840	0.1012	0.1675	0.2691	0.4918	0.7625	1.0827
35	Other Procurement Expense	cA*r28	0.00235	0.0287	0.0318	0.0383	0.0634	0.1018	0.1861	0.2886	0.4097
36	Research and Development Expense	cA*r28	0.00004	0.0004	0.0005	0.0006	0.0010	0.0016	0.0028	0.0044	0.0063
37	Other General and Admin Exp	cA*r28	0.01833	0.2234	0.2477	0.2984	0.4940	0.7935	1.4502	2.2484	3.1924
38	***Total Common Costs***	***Sum r31:r37***		0.5330	0.5906	0.7117	1.1784	1.8928	3.4593	5.3633	7.6151
39											
40	***TELRIC + Common***	***r28 + r38***		**12.73**	**14.11**	**16.99**	**28.14**	**45.19**	**82.59**	**128.05**	**181.82**

c = column, r = row, s = section, p = page

B. 3.2-3.4 Dev Total Prod Costs - Caged Collocation

Row	Version 1.0 Created 3/8/01, 12:59:26 PM			3.2 Grounding											
				Grounding - 90 Day Installation						Grounding - Monthly Charge					
Row	Arizona	Source or Calculation	Factor Value (sF)	#2 AWG per Foot - 90 Day	1/0 AWG per Foot - 90 Day	4/0 AWG per Foot - 90 Day	350 KCMIL per Foot - 90 Day	500 KCMIL per Foot - 90 Day	750 KCMIL per Foot - 90 Day	#2 AWG per Foot Monthly Charge	1/0 AWG per Foot Monthly Charge	4/0 AWG per Foot Monthly Charge	350 KCMIL per Foot Monthly Charge	500 KCMIL per Foot Monthly Charge	750 KCMIL per Foot Monthly Charge
			A												
1	**Investment**	**sC p1-3 cE**													
2															
3	***Total Investment Based Costs***	sC p1-3 cK													
4	***Element Specific Expenses***	sE p2 cC&D		9.1263	15.1844	17.2537	23.9375	26.6746	40.8667	0.0167	0.0277	0.0315	0.0437	0.0487	0.0746
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		9.1263	15.1844	17.2537	23.9375	26.6746	40.8667	0.0167	0.0277	0.0315	0.0437	0.0487	0.0746
6															
7	***Directly Assigned***														
8	Product Management Expense	cA*r5	0.03318	0.3028	0.5038	0.5725	0.7943	0.8851	1.3560	0.0006	0.0009	0.0010	0.0014	0.0016	0.0025
9	Sales Expense	cA*r5	0.01097	0.1001	0.1666	0.1893	0.2626	0.2926	0.4483	0.0002	0.0003	0.0003	0.0005	0.0005	0.0008
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0170	0.0283	0.0321	0.0446	0.0497	0.0761	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001
12	***Directly Assigned Costs***	*Sum r8:r11*		0.4199	0.6987	0.7939	1.1015	1.2274	1.8804	0.0008	0.0013	0.0014	0.0020	0.0022	0.0034
13															
14	***Total Direct***	*r5 + r12*		9.5462	15.8831	18.0476	25.0389	27.9020	42.7472	0.0174	0.0290	0.0329	0.0457	0.0509	0.0780
15															
16	***Directly Attributed***														
17	Network Operations	cA*r14	0.04856	0.4635	0.7712	0.8763	1.2158	1.3548	2.0756	0.0008	0.0014	0.0016	0.0022	0.0025	0.0038
18	Network Support Assets	cA*r14	0.01559	0.1488	0.2476	0.2814	0.3904	0.4350	0.6665	0.0003	0.0005	0.0005	0.0007	0.0008	0.0012
19	General Support Assets	cA*r14	0.08364	0.7984	1.3284	1.5095	2.0942	2.3336	3.5752	0.0015	0.0024	0.0028	0.0038	0.0043	0.0065
20	General Purpose Computers	cA*r14	0.03562	0.3400	0.5657	0.6428	0.8918	0.9938	1.5226	0.0006	0.0010	0.0012	0.0016	0.0018	0.0028
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0094	0.0156	0.0177	0.0246	0.0274	0.0420	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
22	Accounting and Finance Expense	cA*r14	0.00872	0.0833	0.1386	0.1574	0.2184	0.2434	0.3729	0.0002	0.0003	0.0003	0.0004	0.0004	0.0007
23	Human Resources Expense	cA*r14	0.00842	0.0804	0.1338	0.1520	0.2109	0.2350	0.3600	0.0001	0.0002	0.0003	0.0004	0.0004	0.0007
24	Information Management Expense	cA*r14	0.05980	0.5708	0.9498	1.0792	1.4973	1.6685	2.5562	0.0010	0.0017	0.0020	0.0027	0.0030	0.0047
25	Intangibles	cA*r14	0.00277	0.0264	0.0440	0.0500	0.0694	0.0773	0.1184	0.0000	0.0001	0.0001	0.0001	0.0001	0.0002
26	***Total Directly Attributed Costs***	*Sum r17:r25*		2.5212	4.1947	4.7664	6.6128	7.3689	11.2895	0.0046	0.0077	0.0087	0.0121	0.0134	0.0206
27															
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		12.0674	20.0778	22.8140	31.6517	35.2709	54.0367	0.0220	0.0366	0.0416	0.0578	0.0644	0.0986
29															
30	***Common***														
31	Executive Expense	cA*r28	0.00672	0.0811	0.1349	0.1533	0.2127	0.2370	0.3631	0.0001	0.0002	0.0003	0.0004	0.0004	0.0007
32	Planning Expense	cA*r28	0.00058	0.0070	0.0116	0.0132	0.0183	0.0204	0.0313	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
33	External Relations Expense	cA*r28	0.00949	0.1145	0.1905	0.2164	0.3003	0.3346	0.5127	0.0002	0.0003	0.0004	0.0005	0.0006	0.0009
34	Legal Expense	cA*r28	0.00621	0.0750	0.1248	0.1418	0.1967	0.2192	0.3358	0.0001	0.0002	0.0003	0.0004	0.0004	0.0006
35	Other Procurement Expense	cA*r28	0.00235	0.0284	0.0472	0.0537	0.0744	0.0830	0.1271	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
36	Research and Development Expense	cA*r28	0.00004	0.0004	0.0007	0.0008	0.0011	0.0013	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
37	Other General and Admin Exp	cA*r28	0.01833	0.2211	0.3679	0.4181	0.5800	0.6464	0.9903	0.0004	0.0007	0.0008	0.0011	0.0012	0.0018
38	***Total Common Costs***	*Sum r31:r37*		0.5275	0.8777	0.9973	1.3836	1.5418	2.3622	0.0010	0.0016	0.0018	0.0025	0.0028	0.0043
39															
40	***TELRIC + Common***	*r28 + r38*		12.59	20.96	23.81	33.04	36.81	56.40	0.0230	0.0382	0.0435	0.0603	0.0672	0.1029

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B. 3.2-3.4 Dev Total Prod Costs - Caged Collocation

Row	Version 1.0 Created 3/8/01, 12:59:26 PM	Source or Calculation	Factor Value (sF)	3.3 Rent Rent per Square Foot	3.4 Quote Preparation Fee - Caged Construction Quotation Preparation Fee - Caged Construction
	Arizona		A		
1	**Investment**	**sC p1-3 cE**		170.44	
2					
3	***Total Investment Based Costs***	sC p1-3 cK		2.8713	
4	***Element Specific Expenses***	sE p2 cC&D			3451.33
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		2.8713	3451.33
6					
7	***Directly Assigned***				
8	Product Management Expense	cA*r5	0.03318	0.0953	114.52
9	Sales Expense	cA*r5	0.01097	0.0315	37.86
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0053	6.43
12	***Directly Assigned Costs***	*Sum r8:r11*		0.1321	158.81
13					
14	***Total Direct***	*r5 + r12*		3.0034	3610.14
15					
16	***Directly Attributed***				
17	Network Operations	cA*r14	0.04856	0.1458	175.30
18	Network Support Assets	cA*r14	0.01559	0.0468	56.29
19	General Support Assets	cA*r14	0.08364	0.2512	301.94
20	General Purpose Computers	cA*r14	0.03562	0.1070	128.59
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0029	3.54
22	Accounting and Finance Expense	cA*r14	0.00872	0.0262	31.49
23	Human Resources Expense	cA*r14	0.00842	0.0253	30.41
24	Information Management Expense	cA*r14	0.05980	0.1796	215.88
25	Intangibles	cA*r14	0.00277	0.0083	10.00
26	***Total Directly Attributed Costs***	*Sum r17:r25*		0.7932	953.44
27					
28	***Total Element Long Run Incremental Co***	*r 14 + r26*		3.7966	4563.57
29					
30	***Common***				
31	Executive Expense	cA*r28	0.00672	0.0255	30.66
32	Planning Expense	cA*r28	0.00058	0.0022	2.64
33	External Relations Expense	cA*r28	0.00949	0.0360	43.30
34	Legal Expense	cA*r28	0.00621	0.0236	28.36
35	Other Procurement Expense	cA*r28	0.00235	0.0089	10.73
36	Research and Development Expense	cA*r28	0.00004	0.0001	0.16
37	Other General and Admin Exp	cA*r28	0.01833	0.0696	83.63
38	***Total Common Costs***	*Sum r31:r37*		0.1660	199.49
39					
40	***TELRIC + Common***	*r28 + r38*		3.9625	4763.06

c = column, r = row, s = section, p = page

B. 4 Dev Total Prod Costs - Virtual Collocation

	Version 1.0 Created 3/8/01, 12:59:26 PM													
				4.1 Equipment Bay	4.2 Labor									4.3 Quote Preparation Fee - Virtual
Row	Arizona	Source or Calculation	Factor Value (sF)	Equipment Bay per Shelf	Maintenance - Regular Business Hours Per 1/2 Hour	Maintenance - Outside Regular Business Hours Per 1/2 Hour	Training - Regular Business Hours Per 1/2 Hour	Inspector - Regular Business Hours Per 1/2 Hour	Inspector - Outside Regular Business Hours Per 1/2 Hour	Installation - Regular Business Hours Per 1/2 Hour	Installation - Outside Regular Business Hours Per 1/2 Hour	Engineering - Regular Business Hours Per 1/2 Hour	Engineering - Outside Regular Business Hours Per 1/2 Hour	Quotation Preparation Fee - Virtual
			A											
1	**Investment**	**sC p1-3 cE**		153.93										
2														
3	***Total Investment Based Costs***	sC p1-3 cK		2.7176										
4	***Element Specific Expenses***	sE p79 cB&C & p73			20.2700	27.1231	20.2700	23.1100	29.7591	23.1100	29.7591	21.8700	28.2314	3174.25
5	***Total IBC + Element Specific Expenses***	*r3 + r4*		2.7176	20.2700	27.1231	20.2700	23.1100	29.7591	23.1100	29.7591	21.8700	28.2314	3174.25
6														
7	***Directly Assigned***													
8	Product Management Expense	cA*r5	0.03318	0.0902	0.6726	0.9000	0.6726	0.7668	0.9874	0.7668	0.9874	0.7257	0.9367	105.33
9	Sales Expense	cA*r5	0.01097	0.0298	0.2223	0.2975	0.2223	0.2535	0.3264	0.2535	0.3264	0.2399	0.3097	34.82
10	Product Advertising Expense	cA*r5	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.00
11	Business Fees (Other Operating Taxes)	cA*(r5+r8:r10)	0.00178	0.0051	0.0378	0.0505	0.0378	0.0431	0.0554	0.0431	0.0554	0.0407	0.0526	5.91
12	***Directly Assigned Costs***	***Sum r8:r11***		0.1250	0.9327	1.2480	0.9327	1.0634	1.3693	1.0634	1.3693	1.0063	1.2990	146.06
13														
14	***Total Direct***	*r5 + r12*		2.8427	21.2027	28.3711	21.2027	24.1734	31.1284	24.1734	31.1284	22.8763	29.5304	3320.31
15														
16	***Directly Attributed***													
17	Network Operations	cA*r14	0.04856	0.1380	1.0295	1.3776	1.0295	1.1738	1.5115	1.1738	1.5115	1.1108	1.4339	161.22
18	Network Support Assets	cA*r14	0.01559	0.0443	0.3306	0.4424	0.3306	0.3769	0.4854	0.3769	0.4854	0.3567	0.4604	51.77
19	General Support Assets	cA*r14	0.08364	0.2378	1.7733	2.3729	1.7733	2.0218	2.6035	2.0218	2.6035	1.9133	2.4698	277.70
20	General Purpose Computers	cA*r14	0.03562	0.1013	0.7552	1.0105	0.7552	0.8610	1.1087	0.8610	1.1087	0.8148	1.0518	118.26
21	Uncollectible - Interconnect	cA*r14	0.00098	0.0028	0.0208	0.0278	0.0208	0.0237	0.0306	0.0237	0.0306	0.0225	0.0290	3.26
22	Accounting and Finance Expense	cA*r14	0.00872	0.0248	0.1850	0.2475	0.1850	0.2109	0.2715	0.2109	0.2715	0.1996	0.2576	28.96
23	Human Resources Expense	cA*r14	0.00842	0.0239	0.1786	0.2390	0.1786	0.2036	0.2622	0.2036	0.2622	0.1927	0.2487	27.97
24	Information Management Expense	cA*r14	0.05980	0.1700	1.2679	1.6965	1.2679	1.4455	1.8614	1.4455	1.8614	1.3680	1.7659	198.55
25	Intangibles	cA*r14	0.00277	0.0079	0.0587	0.0786	0.0587	0.0670	0.0862	0.0670	0.0862	0.0634	0.0818	9.20
26	***Total Directly Attributed Costs***	***Sum r17:r25***		0.7508	5.5996	7.4928	5.5996	6.3842	8.2210	6.3842	8.2210	6.0416	7.7990	876.89
27														
28	***Total Element Long Run Incremental Co***	***r 14 + r26***		3.5934	26.8023	35.8639	26.8023	30.5576	39.3495	30.5576	39.3495	28.9179	37.3294	4197.20
29														
30	***Common***													
31	Executive Expense	cA*r28	0.00672	0.0241	0.1801	0.2410	0.1801	0.2053	0.2644	0.2053	0.2644	0.1943	0.2508	28.20
32	Planning Expense	cA*r28	0.00058	0.0021	0.0155	0.0208	0.0155	0.0177	0.0228	0.0177	0.0228	0.0167	0.0216	2.43
33	External Relations Expense	cA*r28	0.00949	0.0341	0.2543	0.3403	0.2543	0.2899	0.3733	0.2899	0.3733	0.2744	0.3542	39.82
34	Legal Expense	cA*r28	0.00621	0.0223	0.1666	0.2229	0.1666	0.1899	0.2446	0.1899	0.2446	0.1797	0.2320	26.09
35	Other Procurement Expense	cA*r28	0.00235	0.0085	0.0630	0.0844	0.0630	0.0719	0.0926	0.0719	0.0926	0.0680	0.0878	9.87
36	Research and Development Expense	cA*r28	0.00004	0.0001	0.0010	0.0013	0.0010	0.0011	0.0014	0.0011	0.0014	0.0010	0.0013	0.15
37	Other General and Admin Exp	cA*r28	0.01833	0.0659	0.4912	0.6572	0.4912	0.5600	0.7211	0.5600	0.7211	0.5299	0.6841	76.92
38	***Total Common Costs***	***Sum r31:r37***		0.1571	1.1716	1.5678	1.1716	1.3358	1.7201	1.3358	1.7201	1.2641	1.6318	183.48
39														
40	***TELRIC + Common***	*r28 + r38*		3.7505	27.9740	37.4317	27.9740	31.8934	41.0696	31.8934	41.0696	30.1821	38.9612	4380.68

c = column, r = row, s = section, p = page

C. Investment Cost Calculation

	A	B	C	D	E	F	G	H	I	J	K
1	Version 1.0 Created 3/8/01, 12:59:26 PM										
2	Arizona										
3	Acct	FRC	Account Name	Source of Investment	Investment	Depreciation	Cost of Money	Income Tax	Ad Valorem	Maintenance	Total Investment Based Costs
4						cE*(sG p1 cA)	cE*(sG p1 cB)	cE*(sG p1 cC)	cE*(sG p1 cE)	cE*(sG p1 cF)	sum(cF:cJ)
5	**1.2 Entrance Facility**										
6	**Standard Shared Entrance Facility**										
7	2111	20C	Land	*	1.092060	0.0000000	0.0089689	0.0043462	0.0012395	0.0042912	0.018846
8	2121	110C	Building	**	16.905092	0.0391288	0.1075955	0.0521387	0.0191880	0.0664278	0.284479
9	2441	4C	Conduit	sE p3 D7	209.697289	0.3977143	1.1176426	0.5415876	0.2380159	0.0957242	2.390685
10	2232.2	257C	Other Digital Equipment	sE p3 D9	436.8240741	3.9611298	1.6652964	0.8069699	0.4958150	0.5209124	7.450124
11			**Total**		**664.5185148**	**4.3979729**	**2.8995035**	**1.4050424**	**0.7542584**	**0.6873556**	**10.1441328**
12	**Cross Connect Entrance Facility**										
13	2111	20C	Land	*	1.638090	0.0000000	0.0134534	0.0065192	0.0018593	0.0064368	0.028269
14	2121	110C	Building	**	25.357638	0.0586932	0.1613933	0.0782080	0.0287821	0.0996417	0.426718
15	2441	4C	Conduit	sE p3 D12	314.545933	0.5965714	1.6764639	0.8123815	0.3570238	0.1435863	3.586027
16	2232.2	257C	Other Digital Equipment	sE p3 D14	655.2361111	5.9416947	2.4979446	1.2104549	0.7437225	0.7813686	11.175185
17			**Total**		**996.7777722**	**6.5969593**	**4.3492552**	**2.1075636**	**1.1313877**	**1.0310334**	**15.2161992**
18	**Express Entrance Facility**										
19	2111	20C	Land	*	19.657083	0.0000000	0.1614403	0.0782308	0.0223117	0.0772416	0.339224
20	2121	110C	Building	**	304.291650	0.7043180	1.9367195	0.9384962	0.3453847	1.1956999	5.120618
21	2441	4C	Conduit	sE p3 D17	2695.856240	5.1129920	14.3683488	6.9626195	3.0599182	1.2306252	30.734504
22	2232.2	257C	Other Digital Equipment	sE p3 D18	7862.833333	71.3003365	29.9753356	14.5254585	8.9246699	9.3764233	134.102224
23			**Total**		**10882.6383067**	**77.1176466**	**46.4418442**	**22.5048050**	**12.3522845**	**11.8799900**	**170.2965702**

	A	B	C	D	E	F	G	H	I	J	K
1	Version 1.0 Created 3/8/01, 12:59:26 PM										
2	Arizona										
3	Acct	FRC	Account Name	Source of Investment	Investment	Depreciation	Cost of Money	Income Tax	Ad Valorem	Maintenance	Total Investment Based Costs
4						cE*(sG p1 cA)	cE*(sG p1 cB)	cE*(sG p1 cC)	cE*(sG p1 cE)	cE*(sG p1 cF)	sum(cF:cJ)
24	**1.4.1 AC Power**										
25	**DC Equipment Investment per Amp**										
26	2111	20C	Land	*	1.119673	0.000000	0.009196	0.004456	0.001271	0.004400	0.019322
27	2121	110C	Building	**	17.332544	0.040118	0.110316	0.053457	0.019673	0.068107	0.291672
28	2232.3	357C	Other Digital Equipment	sE p4 C5	447.869351	4.061289	1.707404	0.827374	0.508352	0.817261	7.921680
29			Total		**466.321569**	**4.101407**	**1.826916**	**0.885288**	**0.529296**	**0.889768**	**8.232674**
30	**1.4.2 Backup AC Power Feed Usage - Monthly Charges**										
31	**Backup AC Power - Per Amp 120 V**										
32	2111	20C	Land	*	0.750752	0.0000000	0.0061658	0.0029878	0.0008521	0.0029500	0.012956
33	2121	110C	Building	**	11.621637	0.0268996	0.0739680	0.0358434	0.0131911	0.0456667	0.195569
34	2232.3	357C	Other Digital Equipment	sE p4 C10	300.3006912	2.7231329	1.1448308	0.5547625	0.3408548	0.5479812	5.311562
35			Total		**312.6730797**	**2.7500325**	**1.2249646**	**0.5935938**	**0.3548980**	**0.5965979**	**5.5200869**
36	**Backup AC Power - Per Amp 208 V, Single Phase**										
37	2111	20C	Land	*	1.301303	0.0000000	0.0106874	0.0051789	0.0014770	0.0051134	0.022457
38	2121	110C	Building	**	20.144170	0.0466260	0.1282112	0.0621286	0.0228645	0.0791556	0.338986
39	2232.3	357C	Other Digital Equipment	sE p4 C11	520.5211981	4.7200971	1.9843734	0.9615884	0.5908150	0.9498340	9.206708
40			Total		**541.9666715**	**4.7667231**	**2.1232720**	**1.0288959**	**0.6151566**	**1.0341030**	**9.5681506**
41	**Backup AC Power - Per Amp 208 V, Three Phase**										
42	2111	20C	Land	*	2.251254	0.0000000	0.0184892	0.0089595	0.0025553	0.0088462	0.038850
43	2121	110C	Building	**	34.849415	0.0806630	0.2218054	0.1074826	0.0395557	0.1369392	0.586446
44	2232.3	357C	Other Digital Equipment	sE p4 C12	900.5016727	8.1657679	3.4329660	1.6635479	1.0221099	1.6432129	15.927605
45			Total		**937.6023416**	**8.2464309**	**3.6732606**	**1.7799899**	**1.0642209**	**1.7889982**	**16.5529006**
46	**Backup AC Power - Per Amp 240 V, Single Phase**										
47	2111	20C	Land	*	1.501503	0.0000000	0.0123316	0.0059756	0.0017043	0.0059001	0.025912
48	2121	110C	Building	**	23.243274	0.0537992	0.1479360	0.0716869	0.0263822	0.0913334	0.391138
49	2232.3	357C	Other Digital Equipment	sE p4 C13	600.6013824	5.4462659	2.2896617	1.1095250	0.6817096	1.0959623	10.623124
50			Total		**625.3461594**	**5.5000651**	**2.4499293**	**1.1871876**	**0.7097960**	**1.1931958**	**11.0401738**
51	**Backup AC Power - Per Amp 240 V, Three Phase**										
52	2111	20C	Land	*	2.597601	0.0000000	0.0213337	0.0103379	0.0029484	0.0102072	0.044827
53	2121	110C	Building	**	40.210863	0.0930727	0.2559293	0.1240183	0.0456411	0.1580067	0.676668
54	2232.3	357C	Other Digital Equipment	sE p4 C14	1039.0403916	9.4220399	3.9611147	1.9194783	1.1793576	1.8960148	18.378005
55			Total		**1081.8488557**	**9.5151126**	**4.2383777**	**2.0538345**	**1.2279472**	**2.0642287**	**19.0995006**
56	**Backup AC Power - Per Amp 480 V, Three Phase**										
57	2111	20C	Land	*	5.195202	0.0000000	0.0426673	0.0206757	0.0058968	0.0204143	0.089654
58	2121	110C	Building	**	80.421726	0.1861453	0.5118587	0.2480367	0.0912823	0.3160134	1.353336
59	2232.3	357C	Other Digital Equipment	sE p4 C15	2078.0807832	18.8440798	7.9222293	3.8389566	2.3587153	3.7920297	36.756011
60			Total		**2163.6977115**	**19.0302252**	**8.4767553**	**4.1076690**	**2.4558943**	**4.1284574**	**38.1990013**

C. Investment Cost Calculation

	A	B	C	D	E	F	G	H	I	J	K
1	Version 1.0 Created 3/8/01, 12:59:26 PM										
2	Arizona										
3	Acct	FRC	Account Name	Source of Investment	Investment	Depreciation	Cost of Money	Income Tax	Ad Valorem	Maintenance	Total Investment Based Costs
4						cE*(sG p1 cA)	cE*(sG p1 cB)	cE*(sG p1 cC)	cE*(sG p1 cE)	cE*(sG p1 cF)	sum(cF:cJ)
61	**1.5 Security**										
62	**Access Card per Employee**										
63	2111	20C	Land	*	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.000000
64	2121	110C	Building	**	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.000000
65	2124	361C	Office Equipment	sE p4 C17	9.0870832	0.1472235	0.0371335	0.0179941	0.0103142	0.0000000	0.212665
66			**Total**		**9.0870832**	**0.1472235**	**0.0371335**	**0.0179941**	**0.0103142**	**0.0000000**	**0.2126654**
67	**Card Access Per Person per Office per Month**										
68	2111	20C	Land	*	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.000000
69	2121	110C	Building	**	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.000000
70	2124	361C	Office Equipment	sE p4 C19	250.0000000	4.0503521	1.0216000	0.4950473	0.2837613	0.0000000	5.850761
71			**Total**		**250.0000000**	**4.0503521**	**1.0216000**	**0.4950473**	**0.2837613**	**0.0000000**	**5.8507606**
72	**1.6 Composite Clock**										
73	**Central Office Synchronization - Composite Clock, per Port**										
74	2111	20C	Land	*	0.759213	0.000000	0.006235	0.003021	0.000862	0.002983	0.013102
75	2121	110C	Building	**	11.752610	0.027203	0.074802	0.036247	0.013340	0.046181	0.197773
76	2232.3	357C	Other Digital Equipment	sE p4 C21	303.685000	2.753822	1.157733	0.561015	0.344696	0.554157	5.371422
77			**Total**		**316.196822**	**2.781025**	**1.238770**	**0.600283**	**0.358898**	**0.603321**	**5.582297**

	A	B	C	D	E	F	G	H	I	J	K
1	Version 1.0 Created 3/8/01, 12:59:26 PM										
2	Arizona										
3	Acct	FRC	Account Name	Source of Investment	Investment	Depreciation	Cost of Money	Income Tax	Ad Valorem	Maintenance	Total Investment Based Costs
4						cE*(sG p1 cA)	cE*(sG p1 cB)	cE*(sG p1 cC)	cE*(sG p1 cE)	cE*(sG p1 cF)	sum(cF:cJ)
78	**1.7 Interconnection Tie Pair**										
79	**DS0 Per Connection**										
80	2111	20C	Land	*	0.064419	0.0000000	0.0005291	0.0002564	0.0000731	0.0002531	0.001112
81	2121	110C	Building	**	0.976048	0.0022592	0.0062122	0.0030103	0.0011079	0.0038353	0.016425
82	2232.3	377C	Digital Switch	sE p4 C23	19.5209582	0.1703453	0.0742117	0.0359616	0.0221572	0.0457317	0.348407
83			**Total**		**20.5614253**	**0.1726045**	**0.0809530**	**0.0392283**	**0.0233381**	**0.0498202**	**0.3659441**
84	**DS1 Per Connection**										
85	2111	20C	Land	*	0.155567	0.0000000	0.0012776	0.0006191	0.0001766	0.0006113	0.002685
86	2121	110C	Building	**	2.408176	0.0055740	0.0153273	0.0074273	0.0027334	0.0094628	0.040525
87	2232.3	357C	Other Digital Equipment	sE p4 C24	62.2267802	0.5642737	0.2372260	0.1149551	0.0706302	0.1135499	1.100635
88			**Total**		**64.7905235**	**0.5698477**	**0.2538309**	**0.1230015**	**0.0735402**	**0.1236240**	**1.1438443**
89	**DS3 Per Connection**										
90	2111	20C	Land	*	1.568605	0.0000000	0.0128827	0.0062427	0.0017804	0.0061638	0.027070
91	2121	110C	Building	**	24.282012	0.0562035	0.1545473	0.0748906	0.0275612	0.0954150	0.408618
92	2232.3	357C	Other Digital Equipment	sE p4 C25	627.4421693	5.6896587	2.3919863	1.1591095	0.7121751	1.1449407	11.097870
93			**Total**		**653.2927867**	**5.7458622**	**2.5594163**	**1.2402428**	**0.7415167**	**1.2465195**	**11.5335575**
94	**2.2 & 3.3 Space Rental**										
95	2111	20C	Land	sE p4 C27	7.2000000	0.0000000	0.0591324	0.0286544	0.0081723	0.0282921	0.124251
96	2121	110C	Building	sE p4 C28	163.2410650	0.3778402	1.0389774	0.5034680	0.1852860	0.6414482	2.747020
97			**Total**		**170.4410650**	**0.3778402**	**1.0981098**	**0.5321224**	**0.1934583**	**0.6697402**	**2.8712710**
98	**4.1 Equipment Bay**										
99	2111	20C	Land	*	0.369608	0.0000000	0.0030355	0.0014710	0.0004195	0.0014524	0.006378
100	2121	110C	Building	**	5.721529	0.0132431	0.0364157	0.0176463	0.0064942	0.0224825	0.096282
101	2232.3	357C	Office Equipment	sE p78 C16	147.8431373	1.3406446	0.5636197	0.2731190	0.1678086	0.2697804	2.614972
102			**Total**		**153.9342745**	**1.3538878**	**0.6030709**	**0.2922363**	**0.1747223**	**0.2937153**	**2.7176327**
103	c = column, r = row, s = section, p = page										
104	* Land= (sH p1 D10) * 377C + (sH p1 E10) * (57C+257C+357C+357CS)										
105	** Building = (sH p1 B10) * 377C + (sH p1 C10) * (57C+257C+357C+357CS)										

E. 1.2 XConnect Entrance Fac

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Arizona				
CROSS CONNECT ENTRANCE FACILITY				
DIRECT EXPENSES				
	Collocation Entrance Facility	1998 Expense	Expense X Sales Tax	FRC Code
1	Fiber Cable Per Ft. Expense	$1.03	$1.03	85C
2	Utility Hole Expense	$6,487.54	$6,487.54	4C
3	Cut & Replace Road Covering - Utility Hole	$1,997.60	$1,997.60	4C
4	Cut & Replace Concrete Per Trench Ft. - Conduit	$12.36	$12.36	4C
5	Backfill Utility Hole	$816.60	$816.60	4C
6	Backfill Conduit Trench Per Trench Ft.	$5.21	$5.21	4C
7	Conduit Expense Per Ft.	$21.63	$21.63	4C
8	Expense for Pumping Utility Hole	$499.96	$499.96	4C
9	Per Ft. Expense for Pulling Fiber in Conduit	$1.36	$1.36	4C
10	Innerduct Per Ft.	$2.66	$2.66	4C
11	Fiber Cable Per Ft.	$1.16	$1.16	257C
12	Fiber Cable Racking Per Ft	$181.45	$181.45	257C
13	Fiber Cable Splicing - Per Setup	$366.99	$366.99	85C
14	Fiber Cable Splicing - Per Fiber Spliced	$16.32	$16.32	85C
15	Fiber Distribution Panel	$1,394.72	$1,394.72	357C
16	Single Fiber Jumper	$125.00	$125.00	357C
17	Attenuator Per Fiber	$0.00	$0.00	357C
18	Core Drill	$112.00	$112.00	4C
19	Placing Fiber Cable on Cable Racking Per Ft	$2.39	$2.39	257C
ASSUMPTIONS				
1	Distance from POI to USW Manhole '0' (feet)	50		
2	Fibers required per Collocator	12		
3	Collocators per Utility Hole/Conduit/CO	3		
4	Core Drills per Manhole	2		
5	Number of Fiber Splice Setup	2		
6	Number of fibers spliced per CLEC	12		
7	Number of Fiber Distribution Panel	2		
8	Distance from Manhole '0' to Cable Vault	108		
9	Distance between Manhole 1 and Manhole '0'	302		
10	Weighting Use of POI	60%		
11	Weighting of use of Existing Manhole = (1-%POI)	40%		
12	Distance of New Cable Racking	20		
13	Distance of Shared Cable Racking	130		
14	Distance from Cable Vault to CLEC Space	150		

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
CALCULATIONS			
	Utility Hole - POI		
1	Utility Hole Expense	$6,487.54	See Direct Expense 2
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense 3
3	Backfill Utility Hole	$816.60	See Direct Expense 5
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3
5	Number of Collocators per Utility Hole	3	See Assumption 3
6	Number of Fibers per Collocator	12	See Assumption 2
7	Utility Hole Expense Per Fiber	$258.38	Line 4/Line 5/Line 6
8	% Weighting	60%	See Assumption 10
9	Total Utility Hole Expense	$155.03	Line 7 X Line 8
	Conduit - POI		
1	Conduit Expense per Foot	$21.63	See Direct Expense 7
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense 4
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense 6
4	Total Conduit Expenses per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between POI and USW Manhole '0'	50	See Assumptions 1
6	Total Conduit Expense	$1,960.00	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Number of Fibers per Collocator	12	See Assumption 2
9	Conduit Expense per Fiber	$54.44	Line 6/Line 7/Line 8
10	% Weighting	60%	See Assumption 10
11	Total Utility Hole Expense	$32.67	Line 9 X Line 10
	Innerduct - POI		
1	Innerduct Expense per Foot	$2.66	See Direct Expense 10
2	Pull Fiber from Utility Hole to Cable Vault Per Foot	$1.36	See Direct Expense 9
3	Total Innerduct Expense Per Foot	$4.02	Line 1 + Line 2
4	Distance between POI and USW Manhole '0'	50	See Assumption 1
5	Total Innerduct Expense	$201.00	Line 3 X Line 4
6	Pump Utility Hole Expense	$499.96	See Direct Expense 8
7	Total Expenses	$700.96	Line 5 + Line 6
8	Number of Fibers per Collocator	12	See Assumption 2
9	Cable and Innerduct Expense per Fiber	$58.41	Line 7/Line 8
10	% Weighting	60%	See Assumption 10
11	Total Utility Hole Expense	$35.05	Line 10 X Line 11
	Outside Cable (POI to Manhole '0')		
1	Fiber Cable Expense per Foot	$1.03	See Direct Expense 1
2	Distance between POI and USW Manhole '0'	50	See Assumption 1
3	Number of Fibers per Collocator	12	See Assumption 2
4	Cable Expense per Fiber	$4.29	(Line 1 X Line 2)/Line 3
5	% Weighting	60%	See Assumption 10
6	Total Utility Hole Expense	$2.58	Line 4 X Line 5

E. 1.2 XConnect Entrance Fac

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
	Outside Cable (Manhole '0' to Cable Vault)		
1	Fiber Cable Expense per Foot	$1.03	See Direct Expense 1
2	Distance between POI and USW Manhole '0'	108	See Assumption 7
3	Number of Fibers per Collocator	12	See Assumption 2
4	Cable Expense per Fiber	$9.27	(Line 1 X Line 2)/Line 3
	Outside Cable (Manhole 1 to Manhole '0')		
1	Fiber Cable Expense per Foot	$1.03	See Direct Expense 1
2	Distance between POI and USW Manhole '0'	302	See Assumption 1
3	Number of Fibers per Collocator	12	See Assumption 2
4	Cable Expense per Fiber	$25.92	(Line 1 X Line 2)/Line 3
5	% Weighting	40%	See Assumption 11
6	Total Utility Hole Expense	$10.37	Line 4 X Line 5
	Pulling Fiber		
1	Pulling Fiber from Manhole '0' to Cable Vault	$1.36	See Direct Expense/Investment 9
2	Distance between Manhole '0' and Cable Vault	108	See Assumption 7
3	Total Expense from Manhole '0' to Cable Vault	$146.88	Line 1 X Line 2
4	Pulling Fiber from Manhole 1 to Manhole '0'	$1.36	See Direct Expense/Investment 9
5	Distance between Manhole 1 to Manhole '0'	302	See Assumption 8
6	Total Expense from Manhole 1 to Manhole '0'	$410.72	Line 4 X Line 5
7	% Weighting	40%	See Assumption 11
8	Total Expense from Manhole 1 to Manhole '0' weighted	$164.29	Line 6 X Line 7
9	Pulling Fiber from POI to Manhole '0'	$1.36	See Direct Expense/Investment 9
10	Distance between POI and Manhole '0'	50	See Assumption 1
11	Total Expense from POI and Manhole '0'	$68.00	Line 9 X Line 10
12	% Weighting	60%	See Assumption 10
13	Total Expense from POI and Manhole '0'	$40.80	Line 11 X Line 12
14	Total Pull Fiber Expense	$351.97	Line 3 + Line 8 + Line 13
	Cable		
1	Cable Expense	$1.16	See Direct Expense 11
2	Cable Placement Per Ft	$2.39	See Direct Expense/Investment 19
3	Number of Feet	150	See Assumption 14
4	Number of Fibers per Collocator	12	See Assumption 2
5	Cable Expense per Fiber	$44.38	Line 1/Line 2
	Cable Rack		
1	Cable Rack Expense	$181.45	See Direct Expense 12
2	Number of Feet	20	See Assumption 13
3	Number of Collocators per Cable Rack	3	See Assumption 3
4	Number of Fibers per Collocator	12	See Assumption 2
5	Cable Rack Expense per Fiber	$100.81	Line 1/Line 2/Line 3

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
	Fiber Distribution Panel		
1	Fiber Distribution Panel Expense	$1,394.72	See Direct Expense 15
2	Number of Fiber Distribution Panels	2	See Assumption 7
3	Total Fiber Distribution Panel Expense	$2,789.44	Line 1 X Line 2
4	Number of Fibers Per Collocator	12	See Assumption 2
5	Fiber Distribution Panel Expense per Fiber	$232.45	Line 3/Line 4
	Single Fiber Jumper		
1	Single Fiber Jumper per Fiber	$125.00	See Direct Expense 16
	Attenuator		
1	Attenuator Expense per Fiber	$0.00	See Direct Expense 17
	Core Drill		
1	Core Drill Expense per Drill	$112.00	See Direct Expense/Investment 18
2	Core Drills required per POI	2	See Assumption 4
3	Total Core Drill Expense for POI	$224.00	Line 1 X Line 2
4	% Weighting	60%	See Assumption 10
5	Total Expense For POI	$134.40	Line 3 X Line 4
6	Number of Core Drill Expense per Manhole 1	1	
7	Total Core Drill Expense for Manhole 1	$112.00	Line 1 X Line 6
8	% Weighting	40%	See Assumption 11
9	Total Expense for Manhole 1	$44.80	Line 7 X Line 8
10	Number of Core Drill Expense per Manhole 0	1	
11	Total Core Drill Expense for Manhole 0	$112.00	Line 1 X Line 10
12	Total Core Drill Expense	$291.20	Line 5 + Line 9 + Line 11
13	Number of Collocators per Central Office	3	See Assumption 3
14	Number of Fibers Per Collocator	12	See Assumption 2
15	Core Drill Expense per Fiber	$8.09	Line 12/Line 13/Line 14
	Fiber Cable Splicing		
1	Fiber Cable Splicing - per Setup	$366.99	See Direct Expense 13
2	Number of Splices per Fiber	12	See Assumption 5
3	Total Fiber Cable Splicing Setup per Collocator	$30.58	Line 1/Line 2
4	Fiber Cable Splicing - per Fiber Spliced	$16.32	See Direct Expense 14
5	Total Fiber Cable Splicing	$46.90	Line 4 + Line 5
6	Number of Splices per Fiber	2	See Assumption 5
7	Total Fiber Cable Splicing per Fiber	$93.81	Line 7 X Line 8

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
Investment			
	Manhole '0'		
1	Utility Hole Expense	$6,487.54	See Direct Expense/Investment 2
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense/Investment 3
3	Backfill Utility Hole	$816.60	See Direct Expense/Investment 5
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3
5	Capacity	50	
6	Total Utility Hole Investment per Capacity	$186.03	Line 4/Line 5
7	Number of Collocators per Utility Hole	3	See Assumption 3
8	Number of Fibers per Collocator	12	See Assumption 2
9	Utility Hole Expense Per Fiber	$5.17	Line 6/Line 7/Line 8
	Manhole 1		
1	Utility Hole Expense	$6,487.54	See Direct Expense/Investment 2
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense/Investment 3
3	Backfill Utility Hole	$816.60	See Direct Expense/Investment 5
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3
5	Capacity	20	
6	Total Utility Hole Investment per Capacity	$465.09	Line 4/Line 5
7	Number of Collocators per Utility Hole	3	See Assumption 3
8	Number of Fibers per Collocator	12	See Assumption 2
9	Utility Hole Expense Per Fiber	$12.92	Line 6/Line 7/Line 8
10	% Weighting	40%	See Assumption 11
11	Total Utility Hole Expense per Fiber	$5.17	Line 9 X Line 10
	Conduit (Manhole '0' and Cable Vault)		
1	Conduit Investment per Foot	$21.63	See Direct Expense/Investment 7
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense/Investment 4
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense/Investment 6
4	Total Conduit Investments per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between Manhole '0' and Cable Vault	108	See Assumptions 7
6	Total Conduit Investment	$4,233.60	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Number of Fibers per Collocator	12	See Assumption 2
9	Conduit Investment per Fiber	$117.60	Line 6/Line 7/Line 8

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
	Conduit (Manhole 1 and Manhole '0')		
1	Conduit Investment per Foot	$21.63	See Direct Expense/Investment 7
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense/Investment 4
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense/Investment 6
4	Total Conduit Investments per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between Manhole 1 and Manhole '0'	302	See Assumptions 9
6	Total Conduit Investment	$11,838.40	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Number of Fibers per Collocator	12	See Assumption 2
9	Conduit Investment per Fiber	$328.84	Line 6/Line 7/Line 8
10	% Weighting	40%	See Assumption 11
11	Total Conduit Investment Per Fiber	$131.54	Line 9 X Line 10
	Innerduct (Manhole '0' to Cable Vault)		
1	Innerduct Investment per Foot	$2.66	See Direct Expense/Investment 10
2	Distance between Manhole '0' to Cable Vault	108	See Assumption 8
3	Total Innerduct Investment	$287.28	Line 1 X Line 2
4	Number of Fibers per Collocator	12	See Assumption 2
5	Innerduct Investment per Fiber	$23.94	Line 3/Line 4
	Innerduct (Manhole 1 to Manhole '0')		
1	Innerduct Investment per Foot	$2.66	See Direct Expense/Investment 10
2	Distance between Manhole '0' to Cable Vault	302	See Assumption 8
3	Total Innerduct Investment	$803.32	Line 1 X Line 2
4	Number of Fibers per Collocator	12	See Assumption 2
5	Innerduct Investment per Fiber	$66.94	Line 3/Line 4
6	% Weighting	40%	See Assumption 10
7	Total Innerduct Investment per Fiber	$26.78	Line 5 X Line 6
	Core Drill		
1	Core Drill Investment per Drill	$112.00	See Direct Expense/Investment 18
2	Number of Core Drill Investment per Manhole 1	1	
3	Total Core Drill Investment for Manhole 1	$112.00	Line 1 X Line 2
4	% Weighting	40%	See Assumption 10
5	Total Investment for Manhole 1	$44.80	Line 3 X Line 4
6	Number of Core Drill Investment per Manhole 0	1	
7	Total Core Drill Investment for Manhole 0	$112.00	Line 1 X Line 6
8	Total Core Drill Investment	$156.80	Line 5 + Line 9
9	Number of Collocators per Central Office	3	See Assumption 3
10	Number of Fibers Per Collocator	12	See Assumption 2
11	Core Drill Investment per Fiber	$4.36	Line 8/Line 9/Line 10

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
	Cable Rack		
1	Cable Rack Expense	$181.45	See Direct Expense/Investment 12
2	Number of Feet	130	See Assumption 12
3	Number of Collocators per Cable Rack	3	See Assumption 3
4	Number of Fibers per Collocator	12	See Assumption 2
5	Cable Rack Expense per Fiber	$655.24	Line 1 X Line 2 / Line 3 / Line 4
Total Expense by FRC			
	4C		
1	Utility Hole Expense Per Fiber	$155.03	See Utility Hole 9
2	Conduit Expense per Fiber	$32.67	See Conduit 11
3	Innerduct Expense per Fiber	$35.05	See Innerduct 11
4	Core Drill Expense per Fiber	$8.09	See Core Drill 15
5	Pull Fiber Expense	$351.97	See Pull Fiber 14
	Total Expense for FRC 4C	**$582.80**	Line 1+Line 2+Line 3+Line 4+Line 5
	85C		
1	Cable Expense per Fiber (POI to Manhole '0')	$2.58	See Cable (POI to Manhole '0') 6
2	Cable Expense per Fiber (Manhole '0' to Manhole Cable Vault)	$9.27	See Cable (Manhole 0 to Cable Vault) 4
3	Cable Expense per Fiber (Manhole 1 to Manhole '0')	$10.37	See Cable (Manhole 1 to Manhole '0') 6
4	Fiber Cable Splicing Per Fiber	$93.81	See Fiber Cable Splicing 7
	Total Expense for FRC 85C	**$116.02**	Line 1+Line 2+Line 3+Line 4
	257C		
1	Cable Expense per Fiber	$44.38	See Cable 4
2	Cable Rack Expense per Fiber	$100.81	See Cable Rack 5
	Total Expense for FRC 257C	**$145.18**	Line 1 + Line 2
	357C		
1	Fiber Distribution Panel Expense per Fiber	$232.45	See Fiber Distribution Panel 3
2	Single Fiber Jumper per Fiber	$125.00	See Single Fiber Jumper 1
3	Attenuator per Fiber	$0.00	See Attenuator 1
	Total Expense for FRC 357C	**$357.45**	Line 1 + Line 2 + Line 3

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Arizona			
CROSS CONNECT ENTRANCE FACILITY			
Total Investment by FRC			
	4C		
1	Manhole '0' Investment Per Fiber	$5.17	See Manhole '0' 9
2	Conduit (Manhole '0' to Cable Vault)Investment per Fiber	$117.60	See Conduit (Manhole '0' to Cable Vault) 9
3	Innerduct (Manhole '0' to Cable Vault) Investment per Fiber	$23.94	See Innerduct (Manhole '0' to Cable Vault) 5
4	Manhole 1 Investment Per Fiber	$5.17	See Manhole 1 11
5	Conduit (Manhole 1 to Manhole '0')Investment per Fiber	$131.54	See Conduit (Manhole 1 to Manhole '0') 7
6	Innerduct (Manhole 1 to Manhole '0') Investment per Fiber	$26.78	See Innerduct (Manhole 1 to Manhole '0') 7
7	Core Drill Investment per Fiber	$4.36	See Core Drill 11 p.134
	Total Investment for FRC 4C	**$314.55**	Line 1 + Line 2 + Line 3 + Line 4 + Line 5 + Line 6 + Line 7
	257C		
1	Cable Racking (Shared)	$655.24	See Cable Rack 5
	Total Investment for FRC 257C	**$655.24**	Line 1

E. 1.2 XConnect Entrance Fac

Cell: A27
Comment: Defaults were provided by product management team

Version 1.0 Created 3/8/01, 12:59:26 PM				
Arizona				
DEDICATED EXPRESS FIBER (CLEC PROVIDES FIRE RATED CABLE)				
DIRECT EXPENSES				
	Collocation Entrance Facility	1998 Expense	Expense X Sales Tax	FRC Code
1	Utility Hole Expense	$6,487.54	$6,487.54	4C
2	Cut & Replace Road Covering - Utility Hole	$1,997.60	$1,997.60	4C
3	Cut & Replace Concrete Per Trench Ft. - Conduit	$12.36	$12.36	4C
4	Backfill Utility Hole	$816.60	$816.60	4C
5	Backfill Conduit Trench Per Trench Ft.	$5.21	$5.21	4C
6	Conduit Expense Per Ft.	$21.63	$21.63	4C
7	Expense for Pumping Utility Hole	$499.96	$499.96	4C
8	Per Ft. Expense for Pulling Fiber in Conduit	$1.36	$1.36	4C
9	Innerduct Per Ft.	$2.66	$2.66	4C
10	Core Drill	$112.00	$112.00	4C
11	Cable Rack Per Ft	$181.45	$181.45	257C
12	Placing Fiber on Cable Racking Per Ft.	$2.39	$2.39	257C
ASSUMPTIONS				
1	Distance from POI to Manhole '0' (feet)	50		
2	Core Drills per central office	2		
3	Collocators per Utility Hole/Conduit/CO	3		
4	Distance from POI to Cable Vault (feet)	150		
5	Distance for New Cable Racking	20		
6	Distance for Existing Cable Racking	130		
7	Distance from Manhole '0' to Cable Vault	108		
8	Distance between Manhole 1 and Manhole '0'	302		
9	Weighting Use of POI	60%		
10	Weighting of use of Existing Manhole = (1-%POI)	40%		
11	Distance of New Cable Racking	20		
12	Distance of Shared Cable Racking	130		
13	Distance from Cable Vault to CLEC Space	150		
CALCULATIONS				
	Utility Hole			
1	Utility Hole Expense	$6,487.54	See Direct Expense 1	
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense 2	
3	Backfill Utility Hole	$816.60	See Direct Expense 4	
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3	
5	Number of Collocators per Utility Hole	3	See Assumption 3	
6	Utility Hole Expense Per Collocator	$3,100.58	Line 4/Line 5	
7	% Weighting	60%	See Assumption 9	
8	Total Utility Hole Expense	$1,860.35	Line 6 * Line 7	

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Arizona			
DEDICATED EXPRESS FIBER (CLEC PROVIDES FIRE RATED CABLE)			
	Conduit - POI		
1	Conduit Expense per Foot	$21.63	See Direct Expense 6
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense 3
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense 5
4	Total Conduit Expenses per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between POI and USW Cable Vault	50	See Assumption 1
6	Total Conduit Expense	$1,960.00	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Conduit Expense per Collocator	$653.33	Line 6/Line 7
9	% Weighting	60%	See Assumption 9
10	Total Conduit Expense	$392.00	Line 8 * Line 9
	Innerduct		
1	Innerduct Expense per Foot	$2.66	See Direct Expense 9
2	Pull Fiber from Utility Hole to Cable Vault Per Foot	$1.36	See Direct Expense 8
3	Total Innerduct Expense Per Foot	$4.02	Line 1 + Line 2
4	Distance between POI and USW Cable Vault	150	See Assumption 4
5	Total Innerduct Expense	$603.00	Line 3 x Line 4
6	Pump Utility Hole Expense	$499.96	See Direct Expense 7
7	Innerduct Expense per Collocator	$1,102.96	Line 5 + Line 6
8	% Weighting	60%	See Assumption 9
9	Total Innerduct Expense	$661.78	Line 7 * Line 8
	Pulling Fiber		
1	Pulling Fiber from Manhole '0' to Cable Vault	$1.36	See Direct Expense/Investment 9
2	Distance between Manhole '0' and Cable Vault	$108.00	See Assumption 7
3	Total Expense from Manhole '0' to Cable Vault	$146.88	Line 1 X Line 2
4	Pulling Fiber from Manhole 1 to Manhole '0'	$1.36	See Direct Expense/Investment 9
5	Distance between Manhole 1 to Manhole '0'	$302.00	See Assumption 8
6	Total Expense from Manhole 1 to Manhole '0'	$410.72	Line 4 X Line 5
7	Total Expense for Pulling Fiber	$557.60	Line 6 + Line 3
8	% Weighting	40%	See Assumption 10
9	Total Pull Fiber Expense	$223.04	Line 7 * Line 8
	Cable Rack		
1	Cable Rack Expense	$181.45	See Direct Expense 11
2	Number of Feet	20	See Assumption 5
3	Number of Collocators per Cable Rack	3	See Assumption 3
4	Cable Rack Expense per Collocator	$1,209.67	Line 1 X Line 2 / Line 3
	Core Drill		
1	Core Drill Expense per Drill	$112.00	See Direct Expense 14
2	Core Drills required per Central Office	2	See Assumption 2
3	Total Core Drill Expense	$224.00	Line 1 X Line 2
4	% Weighting	60%	See Assumption 9
5	Total Core Drill Expense for POI	$134.40	Line 3 * Line 4
6	Number of Core Drills in MH0	1	
7	Core Drill Expense per Drill	$112.00	See Direct Expense 14
8	% Weighting	40%	See Assumption 10
9	Total Core Drill Expense for MH0	$44.80	Line 7 * Line 8
10	Number of Core Drills in MH1	1	

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Arizona			
DEDICATED EXPRESS FIBER (CLEC PROVIDES FIRE RATED CABLE)			
11	Core Drill Expense per Drill	$112.00	See Direct Expense 14
12	% Weighting	40%	See Assumption 10
13	Total Core Drill Expense for MH1	$44.80	Line10 * Line 11 * Line 12
14	Total Core Drill Expense	$224.00	Line 5 + Line 9 + Line 13
15	Number of Collocators per Central Office	3	See Assumption 3
16	Core Drill Expense per Collocator	$74.67	Line 14 / Line 15
Investment			
	Cable Rack		
1	Cable Rack Investment	$181.45	See Direct Expense 11
2	Number of Feet	130	See Assumption 5
3	Number of Collocators per Cable Rack	3	See Assumption 3
4	Cable Rack per Collocator	$7,862.83	Line 1 X Line 2 / Line 3
	Manhole '0'		
1	Utility Hole Expense	$6,487.54	See Direct Expense/Investment 2
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense/Investment 3
3	Backfill Utility Hole	$816.60	See Direct Expense/Investment 5
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3
5	Capacity	50	
6	Total Utility Hole Investment per Capacity	$186.03	Line 4/Line 5
7	Number of Collocators per Utility Hole	3	See Assumption 3
8	Utility Hole Expense Per Collocator	$62.01	Line 6/Line 7
9	% Weighting	40%	See Assumption 10
10	Total Utility Hole Expense	$24.80	Line 9 X Line 8
	Manhole 1		
1	Utility Hole Expense	$6,487.54	See Direct Expense/Investment 2
2	Cut and Replace Road Covering	$1,997.60	See Direct Expense/Investment 3
3	Backfill Utility Hole	$816.60	See Direct Expense/Investment 5
4	Total Utility Hole Expense	$9,301.74	Line 1 + Line 2 + Line 3
5	Capacity	20	
6	Total Utility Hole Investment per Capacity	$465.09	Line 4/Line 5
7	Number of Collocators per Utility Hole	3	See Assumption 3
9	Utility Hole Expense Per Fiber	$155.03	Line 6/Line 7/Line 8
10	% Weighting	40%	See Assumption 10
11	Total Utility Hole Expense per Fiber	$62.01	Line 9 X Line 10
	Conduit (Manhole '0' and Cable Vault)		
1	Conduit Investment per Foot	$21.63	See Direct Expense/Investment 7
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense/Investment 4
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense/Investment 6
4	Total Conduit Investments per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between Manhole '0' and Cable Vault	108	See Assumptions 7
6	Total Conduit Investment	$4,233.60	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Conduit Investment per Fiber	$1,411.20	Line 6/Line 7
9	% Weighting	40%	See Assumption 10
10	Total Conduit Investment per Fiber	$564.48	Line 9 X Line 8

E. 1.2 Express Entrance Fac

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Arizona			
DEDICATED EXPRESS FIBER (CLEC PROVIDES FIRE RATED CABLE)			
	Conduit (Manhole 1 and Manhole '0')		
1	Conduit Investment per Foot	$21.63	See Direct Expense/Investment 7
2	Cut and Replace Concrete per Trench Foot	$12.36	See Direct Expense/Investment 4
3	Backfill Conduit Trench per Trench Foot	$5.21	See Direct Expense/Investment 6
4	Total Conduit Investments per Foot	$39.20	Line 1 + Line 2 + Line 3
5	Distance between Manhole 1 and Manhole '0'	302	See Assumptions 8
6	Total Conduit Investment	$11,838.40	Line 4 X Line 5
7	Number of Collocators per Conduit	3	See Assumption 3
8	Number of Fibers per Collocator	$3,946.13	See Assumption 2
10	% Weighting	40%	See Assumption 10
11	Total Conduit Investment Per Fiber	$1,578.45	Line 9 X Line 10
	Innerduct (Manhole '0' to Cable Vault)		
1	Innerduct Investment per Foot	$2.66	See Direct Expense/Investment 10
2	Distance between Manhole '0' to Cable Vault	108	See Assumption 7
3	Total Innerduct Investment	$287.28	Line 1 X Line 2
4	% Weighting	40%	See Assumption 10
5	Innerduct Investment per Fiber	$114.91	Line 3 X Line 4
	Innerduct (Manhole 1 to Manhole '0')		
1	Innerduct Investment per Foot	$2.66	See Direct Expense/Investment 10
2	Distance between Manhole 1 to Manhole '0'	302	See Assumption 8
3	Total Innerduct Investment	$803.32	Line 1 X Line 2
4	% Weighting	40%	See Assumption 10
5	Total Innerduct Investment per Fiber	$321.33	Line 3 X Line 4
	Core Drill		
1	Core Drill Investment per Drill	$112.00	See Direct Expense/Investment 18
2	Number of Core Drill Investment per Manhole 1	1	
3	Total Core Drill Investment for Manhole 1	$112.00	Line 1 X Line 2
4	% Weighting	40%	See Assumption 10
5	Total Investment for Manhole 1	$44.80	Line 3 X Line 4
6	Number of Core Drill Investment per Manhole 0	1	
7	Total Core Drill Investment for Manhole 0	$112.00	Line 6 X Line 5
8	% Weighting	40%	See Assumption 10
9	Total Core Drill for MH0	$44.80	Line 7 X Line 8
10	Total Core Drill Investment	$89.60	Line 5 + Line 9
11	Number of Collocators per Central Office	3	See Assumption 3
12	Core Drill Investment per Fiber	$29.87	Line 10/Line 11

E. 1.2 Express Entrance Fac

Version 1.0 Created 3/8/01, 12:59:26 PM			
Arizona			
DEDICATED EXPRESS FIBER (CLEC PROVIDES FIRE RATED CABLE)			
Total Expense by FRC			
	4C		
1	Utility Hole Expense per Collocator	$3,100.58	See Utility Hole 6
2	Conduit Expense per Collocator	$653.33	See Conduit 8
3	Innerduct Expense per Collocator	$1,102.96	See Innerduct 7
4	Pulling Fiber	$223.04	See Pulling Fiber 9
5	Core Drill Expense per Collocator	$74.67	See Core Drill 16
	Total Expense for FRC 4C	**$5,154.58**	**Line 1 + Line 2 + Line 3 + Line 4 + Line 5**
	257C		
1	Cable Rack per Collocator	$1,209.67	See Cable Rack 4
	Total Expense for FRC 257C	**$1,209.67**	**Line 1**
Total Investment By FRC			
	4C		
1	Utility Hole Investment per Collocator	$86.82	See Utility Hole MH0 + MH1
2	Conduit Expense per Collocator	$2,142.93	See Conduit MH0 + MH1
3	Innerduct Expense per Collocator	$436.24	See Innerduct MH0 + MH1
4	Core Drill Expense per Collocator	$29.87	See Core Drill
	Total Investment for FRC 4C	**$2,695.86**	**Line 1 + Line 2 + Line 3 + Line 4**
	257C		
1	Cable Rack per Collocator	$7,862.83	See Cable Rack 4
	Total Expense for FRC 257C	**$7,862.83**	**Line 1**

E. 1.2 Express Entrance Fac

Cell: B15
Comment: 3 - 1 1/4"

E. 1.3 Cable Splicing

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
3	**Fiber Splicing**		
4		Input	Total including sales tax
5			
6	Per Site Setup	$344.00	$344.00
7			
8	Per Fiber Spliced	$27.50	$27.50

E. 1.4 Power Usage

	A	B	C	D
1	**POWER USAGE**			
2				
3	**Expense**			
4	Version 1.0 Created 3/8/01, 12:59:26 PM			
5	Arizona			
6	**100, 200, 300, & 400 Amp Cable**		**20, 30, 40, & 60 Amp Cable**	
7	Eqpt. electric usage	$41,494.69	Eqpt. electric usage	$41,494.69
8	A/C electricity to cool eqpt. heat	$22,613.56	A/C electricity to cool eqpt. heat	$22,613.56
9	Total Expense	$64,108.26	Total Expense	$64,108.26
10	DC Power Usage	1000	DC Power Usage	1000
11	Cost Per Amp Per Month	**$5.34**	Cost Per Amp Per Month	**$2.67**
12				
13	**Eqpt. electric usage**		**A/C electricity to cool eqpt. heat**	
14	Electricity Cost Per Kw/Hour	$0.0783	Base Kw	52
15	Base Kw	52	# of Hours in a Year	8760
16	# of Hours in a Year	8760	BTU's/hour Factor to Watts	3.41
17	rect./inv. eff. / pf	86%	Air-Conditioning Equivalency/BTU	12000
18			A/C Electric Usage	2.23
19			Electricity Cost Per KW/Hour	$0.0783
20			kW Conversion factor	1000
21	Total Cost	$41,494.69	Total Cost	$22,613.56

POWER EQUIPMENT

Investment

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Arizona

Equipment	
DC Plant	$325,036
Engine/Alternators	$81,999
Commercial AC	$40,835
Total	$447,869
DC Power Usage	1000
Equipment Cost Per Amp	**$447.87**

DC Plant

Equipment	equipment cost	vendor E&I cost	total installed cost	replacement parts
Rectifiers - 6, 200 A	$29,329	$15,811	$45,140	$1,466
Power Monitor	$15,262	$11,491	$26,752	$305
400 A BDFB	$45,233	$25,278	$96,618	$2,262
Power Boards & internal cabling	$44,492	$19,825	$64,316	$890
Batteries - 4 strgs., 1680 A-hrs.	$73,039	$12,786	$85,825	$1,461
Sales Tax	$0			$0
Total Cost	$207,354	$85,191	$318,652	$6,384

Engine/Alternator(s)

Equipment	equipment cost	E&I cost	total installed cost	parts, fuel, etc.
Engine/Alternator - 90 KW	$39,829	$12,200	$52,029	$1,991
Diesel Fuel Tank - 350 gal.	$4,614	$3,737	$8,351	
Eng./Alt. AC Distribution	$10,667	$8,640	$19,307	$320
Sales Tax	$0			
Total Cost	$55,110	$24,577	$79,687	$2,311

Commercial AC

Equipment	equipment cost	E&I cost	total installed cost	replacement parts
Comm. AC Distribution	$22,314	$18,074	**$40,388**	$446
Sales Tax	$0			
Total Cost	$22,314	$18,074	**$40,388**	$446

E. 1.4 Power Equipment

	A	B	C	D	E	F
48						
49	**Assumptions**					
50						
51				CLEC pwr usage	50%	
52	base inverter KVA	10	KVA	ring plant size	100	VA
53	rect./inv. eff. / pf	86%		ring circuits	22	
54	DC power usage	1000	A	E&I default factor	1.81	
55	monitor circuits	$137	/mo.	350 gal fuel tank	$4,614	for 48+ hrs.
56	yearly monitoring	4	hrs.	CLECs fed from BDFB	55%	
57	A/C electric usage	2.23	KW/ton			

	A	B	C	D	E	F	G	H
1	Version 1.0 Created 3/8/01, 12:59:26 PM							
2	Arizona							
3								
4	**Expense for Additional Backup AC Feed to equipment,**							
5	**in collocated space, from Backup AC Power Panel,**							
6	**Averaged for 5 actual sites**							
7								
8				**feed costs/ft.**				
9	Site	20 A, 1-ph	20 A, 3-ph	30 A, 1-ph	30 A, 3-ph	40 A, 1-ph	40 A, 3-ph	50 A, 1-ph
10								
11	Minneapolis	$8.37	$10.95	$8.62	$12.29	$9.94	$13.96	$11.12
12	Phoenix	$4.59	$5.58	$5.18	$7.17	$6.25	$8.65	$7.79
13	Salt Lake	$5.19	$6.35	$5.45	$7.13	$6.31	$8.62	$7.32
14	Seattle	$5.25	$6.30	$5.84	$7.91	$6.93	$9.40	$8.48
15	Denver	$5.51	$6.67	$6.10	$8.33	$7.23	$9.83	$8.79
16								
17	Average $/ft	**$5.78**	**$7.17**	**$6.24**	**$8.56**	**$7.33**	**$10.09**	**$8.70**
18								
19								
20	Site	50 A, 3-ph	60 A, 1-ph	60 A, 3-ph	100 A, 1-ph	100 A, 3-ph		
21								
22	Minneapolis	$15.46	$13.84	$19.85	$16.93	$27.58		
23	Phoenix	$11.09	$8.09	$11.56	$10.16	$15.63		
24	Salt Lake	$10.06	$9.28	$13.24	$11.55	$18.01		
25	Seattle	$11.84	$8.80	$12.36	$10.91	$16.55		
26	Denver	$12.28	$9.18	$12.90	$11.35	$17.32		
27								
28	Average $/ft	**$12.15**	**$9.84**	**$13.98**	**$12.18**	**$19.02**		
29								
30								
31	Assumptions							
32	base KW	52	KW					
33	base inverter KVA	10	KVA					
34	rectifier efficiency	0.86						
35	DC power usage	1000	A					
36	monitor circuits	137	/mo.					
37	yearly monitoring	4	hrs.					
38	A/C electric usage	2.23	KW/ton					
39	inflation/apprec. rate	0.02						
40	appreciated year	1998						
41	base cost year	1998						

	A	B	C	D	E	F
1	**Backup AC Power Usage**					
2	**Investment**					
3	Version 1.0 Created 3/8/01, 12:59:26 PM					
4	Arizona	Investment	Rectifier Efficiency	Number of Volts	Watts to Kw Conversion	Investment Per Amp
5		A	B	C	D	E = ((A / B) * C / D
6	120 V	$2,152	86%	120	1000	**$300.30**
7	208 V, Single Phase	$2,152	86%	208	1000	**$520.52**
8	208 V, Three Phase	$2,152	86%	360	1000	**$900.50**
9	240 V, Single Phase	$2,152	86%	240	1000	**$600.60**
10	240 V, Three Phase	$2,152	86%	415	1000	**$1,039.04**
11	480 V, Three Phase	$2,152	86%	830	1000	**$2,078.08**
12						
13		Expense	Rectifier Efficiency	Number of Volts	Watts to Kw Conversion	Expense Per Amp
14		A	B	C	D	E = ((A / B) * C / D
15	120 V	$60	86%	120	1000	**$8.44**
16	208 V, Single Phase	$60	86%	208	1000	**$14.62**
17	208 V, Three Phase	$60	86%	360	1000	**$25.30**
18	240 V, Single Phase	$60	86%	240	1000	**$16.87**
19	240 V, Three Phase	$60	86%	415	1000	**$29.19**
20	480 V, Three Phase	$60	86%	830	1000	**$58.38**
21						
22						
23	**Engine/Alternator(s)**					
24						
25	**Equipment**	**equipment cost**	**E&I cost**	**total installed cost**	**parts, fuel, etc.**	
26						
27	Engine/Alternator - 90 KW	$39,829	$12,200	$52,029	$1,991	
28	Diesel Fuel Tank - 350 gal.	$4,614	$2,397	$7,011		
29	Eng./Alt. AC Distribution	$10,667	$5,542	$16,209	$320	
30	Sales Tax	$0			$0	
31	Total Cost	$55,110	$20,138	$75,248	$2,311	
32	Total Cost per kW			**$1,447.08**	**$44.45**	
33	**Commercial AC**					
34						
35	**Equipment**	**equipment cost**	**E&I cost**	**total installed cost**	**replacement parts**	
36						
37	Comm. AC Distribution	$22,314	$11,592	$33,906	$446	
38	Sales Tax	$0			$0	
39	Total Cost	$22,314	$11,592	$33,906	$446	
40	Total Cost per kW			**$652.04**	**$8.58**	

E. 1.4 Backup AC Power Usage

	A	B	C	D	E	F
41	**Usage**					
42	**Assumptions**					
43	Electricity Cost Per Kw-Hour	$0.0461	BTU's/hour Factor to Watts	3.41		
44	# of Hours in a Year	8760	Air-Conditioning Equivalency/BTU	12000		
45	rect./inv. eff. / pf	86%	A/C Electric Usage	2.23		
46	Months in a Year	12	kW Conversion factor	1000		
47	Eqpt. electric usage		$39.13			
48	A/C electricity to cool eqpt. heat		$21.33			
49						
50						
51	**Assumptions**					
52						
53	base KW	52	KW	CLEC pwr usage	50%	
54	base inverter KVA	10	KVA	ring plant size	100	VA
55	rect./inv. eff. / pf	86%		ring circuits	22	
56	DC power usage	1000	A	E&I default factor	1.5195	
57	monitor circuits	$137	/mo.	350 gal fuel tank	$4,614	for 48+ hrs.
58	yearly monitoring	4	hrs.	CLECs fed from BDFB	55%	
59	A/C electric usage	2.23	KW/ton			

E. 1.5 Security - Per Person

	A	B	C	D	E	F
1	**Security Per Person**		Version 1.0 Created 3/8/01, 12:59:26 PM			
2			Arizona			
3	**Investments**					
4			1998 INVESTMENT	EMPLOYEES REQUIRING CARDS	INVESTMENT PER PERSON	
5			A	B	C = A/B	
6	ID CARDS	EQUIPMENT (Note 1)	$235,550.00			
7		SUPPLIES (Note 2)	$189,894.16			
8		MAINTENANCE	$28,910.00			
9		**Total**	$454,354.16	50,000	$9.09	
10						
11	CARD ACCESS	CONTROLLER	$7,000.00			
12		ADDITIONAL CARD READER	$3,000.00			
13		**TOTAL**	$10,000.00	40	250	
14						
15						
16	**DIRECT EXPENSE**					
17			HOURS PER BADGE	LABOR RATE	EXPENSE PER BADGE	EXPENSE PER MONTH
18	ID CARDS		A	B	C = A x B	Note 3
19		HOURS FOR BADGING	0.25	$35.83	$8.96	**$0.41**
20						
21						
22						
23	**Physical Control Access Manager 1996 Actual Invoices					
24						
25	Notes:					
26	1. Equipment includes Server, 7 workstations, licensing of workstation, licensing of server, and 35 remote					
27	workstations					
28	2. Supplies include ribbon, top coat for badges, cleaner, hole punch, and cards					

E. 1.6 CO Synchronization

	A	B	C	D	E
1	**CO SYNCHRONIZATION**				
2	SYNC-DCD523 Models				
3	Version 1.0 Created 3/8/01, 12:59:26 PM				
4	Arizona			EF&I Expense	70% Fill
5					Expense/Port
6					
7	Model 1	(70 ports max)		$24,454.45	$332.75
8	Model 2	(100 ports max)		$15,308.45	$202.09
9	Model 3	(100 ports max)		$12,109.50	$156.39
10	Model 4	(100 ports max)		$9,053.66	$112.74
11	**Model 2 , most common**				
12					
13	**Avg. Expense/Port @ 70%**			**$202.09**	
14	**PRS Traceability Expense/Port**			**$10.71**	
15					
16	Power Expense/Month/Port			0.155	
17	Relay Rack Space			1.67	
18	Floor Space Rental/Month/Port			0.015	
19	Cable Racking			1.80	
20	Cabling to Network Element				
21	22 Ga. 2 Wire shielded cable			Wire Wrap	Connectorized
22	Expense/Foot			$0.15	$0.10
23	Average Run (ft)			200	200
24	Connector Assembly				$6.00
25	Install (hrs)			1.5	1.5
26	Install Expense/Hr			$39.61	$39.61
27	Total Install & Material Expense			$89.42	$85.42
28	**Avg. Expense/Install**			**$87.42**	
29					
30					
31	Expense for 1 CC or T1 port				
32	Avg. EF&I Expense/Equip/Port			$202.09	
33	Avg. Prs Expense			$10.71	
34	Avg. Expense, Cable Install to NE			$87.42	
35	RR Space			$1.67	
36	Cable Rack			$1.80	
37	**Total Expense/Port**			**$303.69**	

E. 1.7 ITP

	A	B	C	D	E
1	**ITP**				
2	**Investment**				
3	Version 1.0 Created 3/8/01, 12:59:26 PM				
4	Arizona	DS0	DS1	DS3	
5	ICDF Frame	$3,172.50	$5,139.50	$10,151.88	
6	Frame Capacity	40	18	8	
7	Frame Cost Per Unit	$79.31	$285.53	$1,268.99	
8	89 Block	$85.46			
9	DSX Panel		$524.25	$3,534.30	
10	Block/Panel Placement	$ 182.85	$ 125.16	$ 125.16	
11	Fill Factor	74%	73%	73%	
12	Capacity	100	56	24	
13	**Subtotal**	**$4.70**	**$22.87**	**$79.57**	
14					
15	COSMIC Frame	$45,000.00			
16	DSX Frame		$5,139.50	$10,151.88	
17	Capacity of Frames	1100	18	8	
18	Cost Per Unit of Frame	$40.91	$285.53	$1,268.99	
19	112 Block	$58.14			
20	DSX Panel		$524.24	$3,259.44	
21	Block/Panel Placement	$182.85	$125.16	$125.16	
22	Fill Factor	74%	73%	73%	
23	Meld Run Engineering	$600.00	N/A	N/A	
24	Capacity	100	56	24	
25	Meld Run Per Pair	$0.07	N/A	N/A	
26	**Subtotal**	**$9.88**	**$22.87**	**$265.62**	
27					
28	Cable Racking Per Ft	$93.85	$93.85	$93.85	
29	Aerial Support Per Ft	$87.59	$87.59	$87.59	
30	Capacity Per Rack	219	322	833	
31	Cable Rack Per Ft	$0.83	$0.56	$0.22	
32	Cable Per Ft	$1.46	$1.13	$0.89	
33	Placement of Cable Per Ft	$1.37	$1.37	$0.80	
34	# of Feet	100	55	54	
35	# of Cable Required	1	2	2	
36	# of Terminations Per Cable	100	28	1	
37	Fill Factor	74%	73%	73%	
38	**Total Cable Racking & Cable**	**$4.94**	**$16.49**	**$282.25**	
39					
40	**TOTAL**	**$19.52**	**$62.23**	**$627.44**	

E. 2.1 Bay Support

	A	B	C
1	**Bay Support**		
2	Version 1.0 Created 3/8/01, 12:59:26 PM	Cageless	
3	Arizona		
4	**Bay**		
5	Number of Bays	7.5	
6	Expense per Bay	$ 279.71	
7	Total Material Expense	$ 2,097.80	
8	45 Day Labor Expense per 1st Bay	$ 497.82	
9	45 Day Labor Expense add'l Bay	$ 393.61	
10	Total 45 Day Labor Expense	$ 3,056.29	
11	Total 45 Day Expense	$ 5,154.09	
12			
13	90 Day Labor Expense per Bay	$ 438.27	
14	90 Day Labor Expense add'l Bay	$ 332.62	
15	Total 90 Day Labor Expense	$ 2,600.30	
16	Total 90 Day Expense	$ 4,698.10	
17			
18			
19	**AC Outlet**		
20	Number of AC Outlets	2.25	
21	Expense per AC Outlet	$ 94.05	
22	Total Material	$ 211.61	
23	45 Day Labor Expense per Outlet	$ 126.93	
24	Total 45 Day Labor Expense	$ 285.59	
25	Total 45 Day Expense	$ 497.21	
26			
27	90 Day Labor Expense per Outlet	$ 99.09	
28	Total 90 Day Labor Expense	$ 222.95	
29	Total 90 Day Expense	$ 434.57	
30			
31			
32	**End Guard**		
33	Number of End Guards	3.5	
34	Expense per End Guard	$ 379.46	
35	Total Material Expense	$ 1,328.10	
36	45 Day Labor Expense per End Guard	$ 84.76	
37	Total 45 Day Labor Expense	$ 296.66	
38	Total 45 Day Expense	$ 1,624.76	
39			
40	90 Day Labor Expense per End Guard	$ 58.14	
41	Total 90 Day Labor Expense	$ 203.49	
42	Total 90 Day Expense	$ 1,531.59	
43			
44			
45	**Other**		
46	Number of Anchor Bolts	16.5	
47	Expense per Anchor Bolt Set	27.15	
48	Total	$ 447.98	

E. 2.1 Bay Support

	A	B	C
1	**Bay Support**		
2	Version 1.0 Created 3/8/01, 12:59:26 PM	Cageless	
3	Arizona		
49	Number of Filler Panels	2.875	
50	Expense per Filler Panel	$ 220.09	
51	Total	$ 632.76	
52	Number of Guard Rails	5	
53	Expense per Guard Rail	$ 66.56	
54	Total	$ 332.82	
55	Number of Mountings	28.25	
56	Expense per Mounting	$ 89.70	
57	Total	$ 2,534.06	
58	Number of Miscellaneous Items	12.75	
59	Expense per Miscellaneous Item	$ 0.47	
60	Total	$ 5.97	
61			
62	Grand Total Other	$ 3,953.59	
63			
64	Total Bay Construction Material	$ 7,591.10	
65			
66	45 Day Bay Construction	$ 11,229.64	
67			
68	90 Day Bay Construction	$ 10,617.84	
69			
70			
71			
72		45 Day	90 Day
73	Shipping	$ 1,061.92	$ 1,061.92
74	Tax	$ -	$ -
75	Total Bay Construction	$ 12,291.56	$ 11,679.76
76			
77			
78	Number of Jobs with Support Bays	8	
79	Number of Jobs in Earthquake states	12	
80	% of Jobs that Require Major Aerial Support	50%	
81	Cageless Collocators per office	3	
82	Number of Bays in Standard Configuration	2	
83	Number of Bays to Spread Expense Over	3	
84			
85		45 Day	90 Day
86	Bay Expense - 3 Bays	$ 1,365.73	$ 1,297.75
87	**Total Bay Expense - 2 Bays**	**$ 910.49**	**$ 865.17**
88			
89	**Additional Bay Expense**	**$ 455.24**	**$ 432.58**

E. 2.1 Bay Support

Cell: A1
Comment: Bay Construction
Assumptions
Used only in earthquake zones-WA,OR,UT,AZ,ID,WY,MO
Bay supports will be required when major aerial support is installed
The base cageless expense will include space and reinforcement for 2 bays
The frequency of the need for support bays is directly related to the frequency for the need for major aerial support jobs
The Covad jobs reflect a reasonable relationship between the need for support bays and the need for major aerial support jobs for all offices

Calculation
Total bay expense per job (earthquake states only)= (total number of jobs with support bays/total number of jobs in earthquake states)*average expenses for jobs with support bays/# cageless collocators per office
Expense per bay = total bay expense per job/# bays to spread expense over

Cell: A80
Comment: Victoria H. Bishara:
Only 50% of the jobs required additional Major Aerial support which is directly related to the additional Bay Construction required in earthquake states.

E. 2.1 Cable Hole

	A	B	C
1	**Cable Hole**		
2	Version 1.0 Created 3/8/01, 12:59:26 PM		
3	Arizona		
4	**Fire Stop**		
5	Number of Fire Stop	0.83	
6	Expense per Fire Stop	$ 1.36	
7	Total Material Expense	$ 1.13	
8			
9	45 Day Labor Expense per Fire Stop	$ 271.74	
10	Total 45 Day Labor Expense	$ 225.35	
11	Total 45 Day Expense	$ 226.47	
12			
13	90 Day Labor Expense per Fire Stop	$ 253.32	
14	Total 90 Day Labor Expense	$ 210.07	
15	Total 90 Day Expense	$ 211.20	
16			
17	**Other**		
18	Number of Bags	0.24	
19	Expense per Bag	$ 29.34	
20	Total	$ 7.16	
21	Number of Labels	1.27	
22	Expense per Label	$ 0.22	
23	Total	$ 0.28	
24	Amount of Putty	1.73	
25	Expense of Putty	$ 27.02	
26	Total	$ 46.78	
27	Number of Sheets	0.37	
28	Expense per Sheet	$ 69.55	
29	Total	$ 25.44	
30	Amount of Tape	0.07	
31	Expense of Tape	$ 188.83	
32	Total	$ 13.82	
33	Number of miscellaneous items	0.44	
34	Expense per miscellaneous item	$ 2.64	
35	Total	$ 1.16	
36			
37	**Total Other**	**$ 94.64**	
38			
39	Total Material Expense	$ 95.77	
40			
41			
42		45 Day	90 Day
43	Cable Hole Expense	$ 321.11	$ 305.84
44	Shipping	$ 13.40	$ 13.40
45	Tax	$ -	$ -
46	Total Cable Hole Expense	**$ 334.51**	**$ 319.24**

E. 2.1 Cable Hole

Cell: A1
Comment: Cable Hole

Assumptions

Expenses are to open and shut hole to accommodate new cables.
Must be done every time cable hole is used

Calculations

100% Nonrecurring dedicated
Total average expense of jobs

E. 2.1 Grounding - Cageless

	A	B	C	D
1	**Grounding**	Version 1.0 Created 3/8/01, 12:59:26 PM		
2		Arizona		
3	**1/0 Cable**			
4	1/0 Cable Footage	0.98		
5	Expense per foot of 1/0 Cable	$ 3.12		
6	Total Material	$ 3.04		
7				
8	45 Day Labor Expense per foot of 1/0 Cable	$ 3.42		
9	Total 45 Day Labor Expense	$ 3.34		
10	Total 45 Day Expense	$ 6.38		
11				
12	90 Day Labor Expense per foot of 1/0 Cable	$ 2.42		
13	Total 90 Day Labor Expense	$ 2.36		
14	Total 90 Day Expense	$ 5.40		
15				
16	**# 2 Cable**			
17	#2 Cable Footage	34.88		
18	Expense per foot of #2 Cable	$ 1.56		
19	Total Material	$ 54.32		
20				
21	45 Day Labor Expense per foot of #2 Cable	$ 1.21		
22	Total 45 Day Labor Expense	$ 42.20		
23	Total 45 Day Expense	$ 96.52		
24				
25	90 Day Labor Expense per foot of #2 Cable	$ 0.83		
26	Total 90 Day Labor Expense	$ 28.95		
27	Total 90 Day Expense	$ 83.27		
28				
29	**4/0 Cable**			
30	4/0 Cable Footage	33.66		
31	Expense per foot of 4/0 Cable	$ 2.11		
32	Total Material	$ 71.15		
33				
34	45 Day Labor Expense per foot of 4/0 Cable	$ 6.35		
35	Total 45 Day Labor Expense	$ 213.73		
36	Total 45 Day Expense	$ 284.88		
37				
38	90 Day Labor Expense per foot of 4/0 Cable	$ 4.54		
39	Total 90 Day Labor Expense	$ 152.81		
40	Total 90 Day Expense	$ 223.96		
41				
42				
43	**# 6 Cable**			
44	#6 Cable Footage	0.61		
45	Expense per foot of #6 Cable	$ 0.67		
46	Total Material	$ 0.41		
47				

E. 2.1 Grounding - Cageless

	A	B	C	D
1	**Grounding**	Version 1.0 Created 3/8/01, 12:59:26 PM		
2		Arizona		
48	45 Day Labor Expense per foot of #6 Cable	$ 1.21		
49	Total 45 Day Labor Expense	$ 0.74		
50	Total 45 Day Expense	$ 1.15		
51				
52	90 Day Labor Expense per foot of #6 Cable	$ 0.83		
53	Total 90 Day Labor Expense	$ 0.51		
54	Total 90 Day Expense	$ 0.91		
55				
56	**750 Cable**			
57	750 Cable Footage	10.85		
58	Expense per foot of 750 Cable	$ 8.80		
59	Total Material	$ 95.52		
60				
61	45 Day Labor Expense per foot of 750 Cable	$ 27.42		
62	Total 45 Day Labor Expense	$ 297.61		
63	Total 45 Day Expense	$ 393.12		
64				
65	90 Day Labor Expense per foot of 750 Cable	$ 18.90		
66	Total 90 Day Labor Expense	$ 205.13		
67	Total 90 Day Expense	$ 300.65		
68				
69	**Alternative Racking**			
70	Amount of Alternative Racking	1.07		
71	Expense of Alternative Racking	$ 6.87		
72	Total Alternative Racking Material Expense	$ 7.37		
73				
74	Total Grounding Material Expense	$ 231.81		
75				
76				
77		45 Day	90 Day	
78	Expense for Grounding	$ 789.42	$ 621.57	
79	Shipping	$ 32.43	$ 32.43	
80	Tax	$ -	$ -	
81	Total Expense for Grounding	**$ 821.85**	**$ 653.99**	

E. 2.1 Grounding - Cageless

Cell: A1
Comment: Grounding
Assumptions
Total charged to job

Calculations
100% Nonrecurring dedicated
Total average expense of jobs

E. 2.1 Ground Bar

	A	B	C
1			
2	Version 1.0 Created 3/8/01, 12:59:26 PM		
3	Arizona		
4	**Ground Bar**		
5	Number of Ground Bars	0.07	
6	expense per Ground Bar	$ 83.28	
7	Total Material expense	$ 6.09	
8			
9	45 Day Labor expense per Ground Bar	$ 299.52	
10	Total 45 Day Labor expense	$ 21.92	
11	Total 45 Day expense	$ 28.01	
12			
13	90 Day Labor expense per Ground Bar	$ 247.95	
14	Total 90 Day Labor expense	$ 18.14	
15	Total 90 Day expense	$ 24.24	
16			
17			
18		45 Day	90 Day
19	Ground Bar expense	$ 28.01	$ 24.24
20	Shipping	$ 0.85	$ 0.85
21	Tax	$ -	$ -
22	Total Ground Bar expense	$ 28.86	$ 25.09
23			
24	Number of Collocators per office	3	
25			
26	Ground Bar expense per Collocator	$ 9.62	$ 8.36

E. 2.1 Ground Bar

Cell: A4
Comment: Ground Bar
Assumptions
Ground bar will be required in 5% to 10% of the offices
Ground bar is shared by all collocators

Calculations
Ground bar Expense = Average ground bar expense (jobs)/# collocators

E. 2.1 Misc

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
3	**Miscellaneous**		
4	**Fiber Duct**		
5	Number of Ducts	0.20	
6	Expense per Duct	$ 3.06	
7	Total Material Expense	$ 0.60	
8			
9	45 Day Labor Expense per Duct	$ 22.45	
10	Total 45 Day Labor Expense	$ 4.38	
11	Total 45 Day Expense	$ 4.98	
12			
13	90 Day Labor Expense per Duct	$ 18.89	
14	Total 90 Day Labor Expense	$ 3.69	
15	Total 90 Day Expense	$ 4.28	
16			
17			
18	**Other**		
19	Number of Misc Materials	0.95	
20	Expense for Misc Materials	$ 803.18	
21	Total	$ 764.00	
22	Number of Bolt Kits	0.02	
23	Expense per Bolt Kit	$ 7.53	
24	Total	$ 0.18	
25	Number of Eqpt Nuts and Bolts	0.17	
26	Expense for Eqpt Nuts and Bolts	$ 5.71	
27	Total	$ 0.97	
28	Number of General Nuts and Bolts	17.12	
29	Expense for General Nuts and Bolts	$ 0.40	
30	Total	$ 6.77	
31	Amount of Paint	1.29	
32	Expense for Paint	$ 8.66	
33	Total	$ 11.19	
34	Number of Tags	2.02	
35	Expense per Tag	$ 2.86	
36	Total	$ 5.79	
37	Amount of Tape	0.34	
38	Expense for Tape	$ 9.92	
39	Total	$ 3.39	
40	Number of Miscellaneous Items	5.49	
41	Expense per Miscellaneous Item	$ 115.25	
42	Total	$ 632.50	
43			
44	Total Other	$ 1,424.80	
45			
46	Total Miscellaneous Material Expense	$ 1,425.39	
47			

E. 2.1 Misc

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
3	**Miscellaneous**		
48			
49		45 Day	90 Day
50	Miscellaneous Expense	$ 1,429.78	$ 1,429.08
51	Shipping	$ 199.40	$ 199.40
52	Taxes	$ -	$ -
53	Total Miscellaneous Expense	$ 1,629.17	$ 1,628.48
54			
55	% of Time that Misc Items are	42%	42%
56	Nonrecurring		
57	Number of Bays in Standard Configuration	2	
58	Number of Bays to Spread Expense Over	3	
59			
60			
61	**Total Miscellaneous Expense**	**$ 455.90**	**$ 455.71**
62			
63	Additional Bay	**$ 227.95**	**$ 227.85**

E. 2.1 Motor Vehicle

	A	B
1	Equipment Category	**MOTOR VEHICLE**
2	Material_USW ID	
3	Labor_Item Description	
4	C8WLC02	$ 5.25
5	C8WLC03	$ 30.96
6	C8WLC04	$ 18.00
7	C8WLC05	$ 26.13
8	C8WLC06	$ 20.64
9	C8WLC07	$ 1,354.78
10	C8WLC09	$ -
11	C8WLC11	$ 34.72
12	C8WLC12	$ 5.34
13	C8WLC13	$ -
14	C8WLC14	$ 10.31
15	C8WLC15	$ 26.12
16	C8WLC16	$ 26.96
17	C8WLC18	$ 20.64
18	C92LC19	$ 1,142.88
19	C9MLC01	$ 12.15
20	C9MLC05	$ 8.10
21	C9MLC07	$ 56.24
22	C9MLC08	$ 167.40
23	C9MLC13	$ 5.40
24	C9MLC16	$ 8.10
25	C9MLC17	$ 281.55
26	C9MLC21	$ 3.59
27	C9MLC23	$ 1,589.28
28	C9MLC24	$ 584.55
29	C9MLC26	$ 490.96
30	C9RLC05	$ 855.98
31	C9RLC06	$ 283.50
32	C9RLC08	$ 837.43
33	C9RLC10	$ 1,268.45
34	C9WLC16	$ 165.85
35	C9WLC17	$ 28.25
36		
37	TOTAL	$ 9,369.51
38		
39	Average	**$ 228.52**

	A	B	C	D	E	F	G	H	I	J
1	Version 1.0 Created 3/8/01, 12:59:26 PM		**Expenses for A & B DC Feeds to equipment,**							
2	Arizona		**in collocated space, from BDFB or power board,**							
3					**Averaged for 5 actual sites**					
4		**45 Day**						**90 Day**		
5	**Costs for Virtual/Cageless Collocation**									
6		**20 A**	**30 A**	**40 A**	**60 A**		**20 A**	**30 A**	**40 A**	**60 A**
7										
8	Bellevue Sherwood, WA	$69.18	$69.28	$75.69	$75.81		$58.90	$59.01	$65.42	$65.54
9	Seattle Duwamish, WA	$60.34	$65.88	$98.44	$98.51		$50.88	$56.43	$81.94	$82.01
10	Westminster, CO	$64.21	$64.26	$99.77	$105.91		$54.89	$54.94	$82.73	$89.57
11	Crystal, MN	$60.43	$93.98	$101.16	$168.68		$51.43	$77.56	$85.22	$144.69
12	Portland Alpine, OR	$61.68	$68.05	$68.09	$101.19		$52.04	$58.41	$58.45	$84.47
13										
14		$63.16	$72.29	$88.63	$110.02		$53.63	$61.27	$74.75	$93.26
15		**$4,468**	**$5,114**	**$6,270**	**$7,783**		**$3,794**	**$4,334**	**$5,288**	**$6,597**
16	Shipping	$250.03	$286.15	$350.83	$435.50		$212.28	$242.53	$295.89	$369.15
17	Tax	$ -	$ -	$ -	$ -		$ -	$ -	$ -	$ -
18	Total	$4,718	$5,400	$6,621	$8,218		$4,006	$4,577	$5,584	$6,966
19										
20	**Assumptions**									
21	inflation/apprec. rate	2.0%								
22	appreciated year	1999								
23	base cost year	1999								
24	avg <60 A Physical run	83	ft.							
25	avg Virtual/Cageless run	71	ft.							
26	avg >60 A run	183	ft.							
27	60 A feeds from BDFB	35%		**45 Day Installation**		**90 Day Installation**				
28	1/0 thru 4/0 - #2 H-Tap	$4.66	ea.	$47.58	ea.	$40.07	ea.			
29	350-750 kcmil - 1/0-4/0 H-	$15.22	ea.	$64.45	ea.	$55.20	ea.			
30	350-750 kcmil - #2 H-Tap	$29.32	ea.	$47.58	ea.	$40.07	ea.			
31	kcmil - kcmil H-Tap	$30.54	ea.	$64.45	ea.	$55.20	ea.			
32	#6 AWG lug	$0.24	ea.	$34.80	ea.	$27.83	ea.			
33	#4 AWG lug	$1.22	ea.	$34.80	ea.	$27.83	ea.			
34	#2 AWG lug	$2.26	ea.	$47.58	ea.	$40.07	ea.			
35	1/0 lug	$2.68	ea.	$47.58	ea.	$40.07	ea.			
36	2/0 lug	$4.15	ea.	$47.58	ea.	$40.07	ea.			
37	4/0 lug	$5.80	ea.	$47.58	ea.	$40.07	ea.			
38	350 kcmil lug	$10.72	ea.	$64.45	ea.	$55.20	ea.			
39	500 kcmil lug	$12.44	ea.	$64.45	ea.	$55.20	ea.			
40	750 kcmil lug	$28.76	ea.	$64.45	ea.	$55.20	ea.			
41	#6 AWG cost	$0.55	/ft.	$6.14	/ft.	$3.68	/ft.			
42	#4 AWG cost	$0.88	/ft.	$6.14	/ft.	$4.56	/ft.			
43	#2 AWG cost	$1.97	/ft.	$6.14	/ft.	$4.56	/ft.			
44	1/0 AWG cost	$3.12	/ft.	$8.55	/ft.	$6.46	/ft.			
45	2/0 AWG cost	$3.31	/ft.	$8.55	/ft.	$6.46	/ft.			
46	4/0 AWG cost	$4.67	/ft.	$8.55	/ft.	$6.46	/ft.			
47	350 kcmil cost	$4.82	/ft.	$15.79	/ft.	$12.00	/ft.			
48	500 kcmil cost	$7.16	/ft.	$15.79	/ft.	$12.00	/ft.			
49	750 kcmil cost	$12.54	/ft.	$27.21	/ft.	$21.41	/ft.			
50	25 A fuse	$17.51	ea.	$9.90	ea.	$9.90	ea.			
51	30 A fuse	$18.22	ea.	$9.90	ea.	$9.90	ea.			
52	40 A fuse	$18.94	ea.	$9.90	ea.	$9.90	ea.			
53	50 A fuse	$19.65	ea.	$9.90	ea.	$9.90	ea.			
54	60 A fuse	$20.37	ea.	$9.90	ea.	$9.90	ea.			
55	75 A fuse	$21.29	ea.	$9.90	ea.	$9.90	ea.			
56	75 A fuse/brkr avg	$47.40	ea.	$21.79	ea.	$21.79	ea.			

	A	B	C	D	E	F	G	H	I	J
1	Version 1.0 Created 3/8/01, 12:59:26 PM		**Expenses for A & B DC Feeds to equipment,**							
2	Arizona		**in collocated space, from BDFB or power board,**							
3					**Averaged for 5 actual sites**					
57	80 A fuse/brkr avg	$48.70	ea.	$21.79	ea.	$21.79	ea.			
58	90 A fuse/brkr avg	$75.15	ea.	$21.79	ea.	$21.79	ea.			
59	100 A fuse/brkr avg	$92.40	ea.	$21.79	ea.	$21.79	ea.			
60	125 A fuse/brkr avg	$104.75	ea.	$21.79	ea.	$21.79	ea.			
61	150 A fuse/brkr avg	$116.75	ea.	$21.79	ea.	$21.79	ea.			
62	200 A fuse/brkr avg	$148.00	ea.	$21.79	ea.	$21.79	ea.			
63	250 A fuse/brkr avg	$179.00	ea.	$21.79	ea.	$21.79	ea.			
64	300 A fuse/brkr avg	$218.15	ea.	$21.79	ea.	$21.79	ea.			
65	400 A fuse/brkr avg	$235.80	ea.	$21.79	ea.	$21.79	ea.			
66	500 A fuse/brkr avg	$273.75	ea.	$21.79	ea.	$21.79	ea.			
67	600 A fuse/brkr avg	$307.50	ea.	$21.79	ea.	$21.79	ea.			
68	H-Tap covers	$53.98	/job							
69	miscellaneous material co	$183.13	/job							
70	Nuts & Bolts for Power	$9.14	/job							
71	Alarm fuses	$17.62	/job							
72	Heat Shrink	$17.48	/job							
73	Cable Tags	$79.25	/job							
74	BDFB loop drop	0.25	V							
75	PBD loop drop	1.00	V							

E. 2.1 Lighting - Cageless

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
3	**Lighting**		
4	**Fixtures**		
5	Number of Fixtures	2.56	
6	Expense per Fixture	$ 111.70	
7	Total Material Expense	$ 286.06	
8			
9	45 Day Labor Expense per Fixture	213.59	
10	Total 45 Day Labor Expense	$ 547.00	
11	Total 45 Day Expense	$ 833.06	
12			
13	90 Day Labor Expense per Fixture	202.12	
14	Total 90 Day Labor Expense	$ 517.62	
15	Total 90 Day Expense	$ 803.68	
16			
17			
18	**Lighting**		
19	Number of Lights	1.71	
20	Expense per Light	$ 103.96	
21	Total Material Expense	$ 177.50	
22			
23	45 Day Labor expense per Light	$ 213.59	
24	Total 45 Day Labor expense	$ 364.67	
25	Total 45 Day expense	$ 542.17	
26			
27			
28	90 Day Labor expense per Light	$ 202.12	
29	Total 90 Day Labor expense	$ 345.08	
30	Total 90 Day expense	$ 522.58	
31			
32			
33	**Cable**		
34	Number of Cables	13.66	
35	expense per Cable	$ 0.37	
36	Total Material expense	$ 5.05	
37			
38	45 Day Labor expense per Cable	$ 4.82	
39	Total 45 Day Labor expense	$ 16.46	
40	Total 45 Day expense	$ 21.51	
41			
42			
43	90 Day Labor expense per Cable	$ 3.31	
44	Total 90 Day Labor expense	$ 11.30	
45	Total 90 Day expense	$ 16.36	
46			
47			
48			

E. 2.1 Lighting - Cageless

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
49	**Conduit Support**		
50	Number of Conduit Supports	0.07	
51	expense per Conduit Support	$ 165.46	
52	Total Material expense	$ 12.11	
53			
54	45 Day Labor expense per Conduit Support	$ 19.07	
55	Total 45 Day Labor expense	$ 23.26	
56	Total 45 Day expense	$ 35.36	
57			
58			
59	90 Day Labor expense per Conduit Support	$ 17.77	
60	Total 90 Day Labor expense	$ 21.67	
61	Total 90 Day expense	$ 33.78	
62			
63			
64			
65	**Wire**		
66	Number of Wires	17.07	
67	expense per Wire	$ 0.25	
68	Total Material expense	$ 4.27	
69			
70	45 Day Labor expense per Wire	$ 3.65	
71	Total 45 Day Labor expense	$ 15.58	
72	Total 45 Day expense	$ 19.85	
73			
74			
75	90 Day Labor expense per Wire	$ 2.77	
76	Total 90 Day Labor expense	$ 11.82	
77	Total 90 Day expense	$ 16.09	
78			
79			
80			
81	**Other**		
82	Number of Conduit Supports	0.29	
83	expense per Conduit Support	$ 0.11	
84	Total	$ 0.03	
85	Number of Outlet Raceways	2.27	
86	expense per Outlet Raceway	$ 44.11	
87	Total	$ 100.06	
88	Number of Supports	8.15	
89	expense per Support	$ 8.42	
90	Total	$ 68.62	
91	Number of Switches	1.20	
92	Expense per Switch	$ 97.81	
93	Total	$ 116.89	
94	Number of Fittings	8.73	

E. 2.1 Lighting - Cageless

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
95	Expense per Fitting	$ 4.74	
96	Total	$ 41.37	
97	Number of Fitting Supports	0.73	
98	Expense per Fitting Supports	$ 13.67	
99	Total	$ 10.00	
100	Number of Miscellaneous Items	5.22	
101	Expense per Miscellaneous Item	$ 0.27	
102	Total	$ 1.42	
103			
104	Total Other	$ 338.40	
105			
106	Total Lighting Material Expense	$ 823.38	
107			
108			
109		45 Day	90 Day
110	Lighting Expense	$ 1,790.34	$ 1,730.89
111	Shipping	$ 115.18	$ 115.18
112	Tax	$ -	$ -
113	Total Lighting Expense	$ 1,905.52	$ 1,846.07
114			
115			
116			
117	Number of Light Fixtures	4.27	
118	% of time lighting is required	70%	
119	# of Lights per 8 Bays	3.00	
120	Fill Factor	75%	
121	# of Bays in Standard Configuration	2.00	
122	# of Bays	8	
123	Number of Bays to Spread Expense Over	3	
124			
125			
126		45 Day	90 Day
127	Lighting Expense	$ 312.51	$ 302.76
128	Total Bay Expense - 3 Bays	$ 312.51	$ 302.76
129			
130	**Total Bay Expense - 2 Bays**	**$ 208.34**	**$ 201.84**
131			
132	Each Additional Bay	**$ 104.17**	**$ 100.92**

E. 2.1 Lighting - Cageless

Cell: A3
Comment: Lighting

Assumptions

70% of the time new lighting will be required in an office
Three lights will be required for each set of eight installed bays
A 75% fill factor will be applied to each set of eight bays
Two bays are to be included in the standard configuration
Additional bays (more than 2) will require additional lighting increment

Calculations

Expense Per Installed Light Fixture (from jobs) * 3 lights / 8 bays * 70% Occurrence / 75% fill = expense per bay
Expense Per Bay * 2 = Bay expense in Flat Rate

	A	B	C	D	E
1	**Overall Aerial Support**	Cageless		Caged	
2	Version 1.0 Created 3/8/01, 12:59:26 PM	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
3	Arizona				
4	**Aux Frame Channel**				
5	Number of 10 foot channels	60	7	32	5
6	Number of 20 foot channels	7	1	16	3
7	Expense per 10 foot Channel	$ 18.00	$ 12.94	$ 18.00	$ 12.94
8	Expense per 20 foot Channel	$ 50.10	$ 38.05	$ 50.10	$ 38.05
9	Total Material Expense	$ 1,435.14	$ 110.37	$ 1,377.83	$ 159.82
10	45 Day Labor Expense per 10' Channel	$ 5,007.37	$ 575.78		
11	45 Day Labor Expense per 20' Channel	$ 1,198.95	$ 94.22		
12	Total 45 Day Labor Expense	$ 6,206.32	$ 670.00		
13	Total 45 Day Expense	$ 7,641.46	$ 780.37		
14					
15	90 Day Labor Expense per 10' Channel	$ 4,065.68	$ 467.50	$ 2,176.00	$ 340.00
16	90 Day Labor Expense per 20' Channel	$ 973.47	$ 76.50	$ 2,176.00	$ 340.00
17	Total 90 Day Labor Expense	$ 5,039.16	$ 544.00	$ 4,352.00	$ 680.00
18	Total 90 Day Expense	$ 6,474.30	$ 654.37	$ 5,729.83	$ 839.82
19					
20					
21	**U Channel**				
22	Number of U Channels	1	0	1	0
23	Expense per U Channel	$ 123.25	$ -	$ 123.25	$ -
24	Total Material Expense	$ 110.28	$ -	$ 110.28	$ -
25	45 Day Labor Expense per foot	$ 23.25	$ 23.25		
26	Total 45 Day Labor Expense	$ 416.05	$ -		
27	Total 45 Day Expense	$ 526.33	$ -		
28					
29	90 Day Labor Expense per foot	$ 20.40	$ 13.60	$ 20.40	$ 13.60
30	Total 90 Day Labor Expense	$ 365.05	$ -	$ 365.05	$ -
31	Total 90 Day Expense	$ 475.33	$ -	$ 475.33	$ -
32					
33					
34	Other				
35	Number of Aux Frame Fittings	28.79	3.56	20.64	3.59
36	Expense per Aux Frame Fitting	$ 20.27	$ 19.23	$ 20.27	$ 19.23
37	Total	$ 583.55	$ 68.51	$ 418.40	$ 69.08
38	Number of Aux Frames Support	68.47	18.44	49.09	18.59
39	Expense per Aux Frame Support	$ 7.00	$ 5.12	$ 7.00	$ 5.12
40	Total	$ 479.00	$ 94.31	$ 343.44	$ 95.10
41	Number of Aux Frame Nuts and Bolts	140.47	8.13	100.72	8.19
42	Expense of Aux Frame Nuts and Bolts	$ 0.39	$ 0.29	$ 0.39	$ 0.29
43	Total	$ 55.20	$ 2.37	$ 39.58	$ 2.39
44	Number of Cable Racks Support	0.21	0.00	0.15	0.00
45	Expense per Cable Rack Support	$ 24.19	$ -	$ 24.19	$ -
46	Total	$ 5.09	$ -	$ 3.65	$ -
47	Amount of Insulation	5.47	0.88	3.92	0.88
48	Expense per Insulation	$ 2.63	$ 2.42	$ 2.63	$ 2.42

	A	B	C	D	E
1	**Overall Aerial Support**	Cageless		Caged	
2	Version 1.0 Created 3/8/01, 12:59:26 PM	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
3	Arizona				
49	Total	$ 14.37	$ 2.12	$ 10.31	$ 2.14
50	Number of Miscellaneous Items	17.47	0.13	12.53	0.13
51	Expense per miscellaneous item	$ 11.24	$ 6.58	$ 11.24	$ 6.58
52	Total	$ 196.39	$ 0.82	$ 140.81	$ 0.83
53	Number of Nuts and Bolts - cable racking	0.42	0.25	0.30	0.25
54	Expense of Nuts and Bolts - cable racking	$ 0.52	$ 0.52	$ 0.52	$ 0.52
55	Total	$ 0.22	$ 0.13	$ 0.16	$ 0.13
56	Number of General Support items	1.58	0.00	1.13	0.00
57	Expense of General Support items	$ 1.95	$ -	$ 1.95	$ -
58	Total	$ 3.08	$ -	$ 2.21	$ -
59	Number of U-Channel - Other Items	1.47	7.50	1.06	7.56
60	Expense of U-Channel - Other Items	$ 7.25	$ 2.18	$ 7.25	$ 2.18
61	Total	$ 10.68	$ 16.37	$ 7.66	$ 16.51
62	Number of U-Channel Fittings	0.00	0.25	0.00	0.25
63	Expense of U-Channel Fitting	$ -	$ 2.78	$ -	$ 2.78
64	Total	$ -	$ 0.70	$ -	$ 0.70
65	Grand Total Other	$ 1,347.60	$ 185.32	$ 966.20	$ 186.88
66					
67	Total Overall Aerial Support Material	$ 2,893.02	$ 295.70	$ 2,454.31	$ 346.70
68					
69	Total 45 Day Labor	$ 6,622.37	$ 670.00		
70	Total 90 Day Labor	$ 5,514.49	$ 544.00	$ 4,827.33	$ 680.00
71					
72	Total 45 Day Overall Aerial Support	$ 9,515.39	$ 965.70		
73	Total 90 Day Overall Aerial Support	$ 8,297.23	$ 839.70	$ 7,171.36	$ 1,026.70
74					
75	Shipping	$ 404.70	$ 41.36	$ 343.33	$ 48.50
76	Tax 45 day	$ -	$ -		
77	Tax 90 Day	$ -	$ -	$ -	$ -
78	Grand Total Overall Aerial Support-45 day	$ 9,920.09	$ 1,007.06		
79	Grand Total Overall Aerial Support-90 day	$ 8,701.94	$ 881.06	$ 7,514.70	$ 1,075.20
80					
81					
82	% of Jobs that Require Major Aerial Support	50%		100%	
83	Average Number of Collocators in an Office	3		3	
84	% of Jobs Requiring Any Aerial Support	85%		85%	
85					
86		45 Day	90 Day	90 Day	
87	Total Overall Aerial Support	$ 2,345.19	$ 2,055.60	$ 3,064.35	
88					
89	% of Aerial Support used for Cable Racking	75%		75%	
90	% of Aerial Support used for Panel EICT	12.50%		12.50%	
91					

E. 2.1 & 3.1 Aerial Support

	A	B	C	D	E
1	**Overall Aerial Support**	Cageless		Caged	
2	Version 1.0 Created 3/8/01, 12:59:26 PM	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
3	Arizona				
92		45 Day	90 Day	90 Day	
93	Amount Assigned to Cable Racking	$ 1,758.89	$ 1,541.70	$ 2,298.27	
94	Amount Assigned to Panel EICT	$ 293.15	$ 256.95	$ 383.04	
95	Amount Remaining in Aerial Support	$ 293.15	$ 256.95	$ 383.04	
96					
97	Number of Bays to Spread Expense Over	3			
98	Number of Bays in Standard Configuration	2			
99					
100					
101	Total Expense for Overall Aerial Support-2 Bay	**$ 195.43**	**$ 171.30**	**$ 383.04**	
102					
103	Additional Bay Expense	**$ 97.72**	**$ 85.65**		

E. 2.1 & 3.1 Aerial Support

Cell: A1
Comment: Aerial Support
Assumptions
A major aerial support job costs in excess of $1,000
All other jobs are minor jobs
Major jobs will occur in 50% of the offices when the first collocator enters
Minor jobs will occur on all collocations with the same frequency as COVAD jobs
75% Aerial support is for cable racking

Calculations
Cost for Aerial Support = A * average cost for major aerial support jobs+((total number of jobs with any aerial support/total jobs studied)-A)* cost of minor aerial support jobs, Where: A=50% offices requiring major support
Standard job cost=Cost for aerial support/# bays * # bays in standard configuration jobs/# collocators per office

E. 2.1 & 3.1 Engineering

	A	B	C	D	E
1					
2	**Engineering**				
3		All Jobs		2 highest and	
4	**Job ID**			2 lowest jobs removed	
5	C8WLC09	$ 1,163.00			
6	C9RLC06	$ 2,713.64			
7	C9WLC17	$ 3,963.49		$ 3,963.49	
8	C8WLC18	$ 5,761.44		$ 5,761.44	
9	C9MLC16	$ 6,182.22		$ 6,182.22	
10	C8WLC19	$ 6,669.04		$ 6,669.04	
11	C9RLC08	$ 6,754.10		$ 6,754.10	
12	C9MLC13	$ 6,964.54		$ 6,964.54	
13	C8WLC03	$ 7,048.14		$ 7,048.14	
14	C9MLC06	$ 7,290.89		$ 7,290.89	
15	C9MLC01	$ 7,354.58		$ 7,354.58	
16	C9WLC16	$ 7,576.25		$ 7,576.25	
17	C8WLC20	$ 7,637.24		$ 7,637.24	
18	C8WLC13	$ 7,725.58		$ 7,725.58	
19	C9MLC08	$ 7,747.36		$ 7,747.36	
20	C9MLC19	$ 8,579.03		$ 8,579.03	
21	C9MLC05	$ 8,791.67		$ 8,791.67	
22	C8WLC12	$ 8,904.49		$ 8,904.49	
23	C8WLC17	$ 8,988.83		$ 8,988.83	
24	C9MLC21	$ 9,288.53		$ 9,288.53	
25	C92LC12	$ 9,822.74		$ 9,822.74	
26	C9RLC05	$ 9,898.48		$ 9,898.48	
27	C8WLC14	$ 10,609.28		$ 10,609.28	
28	C8WLC06	$ 10,721.26		$ 10,721.26	
29	C9MLC07	$ 10,839.04		$ 10,839.04	
30	C9MLC17	$ 10,860.84		$ 10,860.84	
31	C9MLC20	$ 10,930.64		$ 10,930.64	
32	C8WLC07	$ 11,379.69		$ 11,379.69	
33	C8WLC15	$ 12,747.86		$ 12,747.86	
34	C8WLC04	$ 13,012.52		$ 13,012.52	
35	C92LC19	$ 13,064.78		$ 13,064.78	
36	C8WLC08	$ 13,151.00		$ 13,151.00	
37	C8WLC02	$ 13,387.69		$ 13,387.69	
38	C8WLC16	$ 13,423.84		$ 13,423.84	
39	C8WLC21	$ 15,822.91		$ 15,822.91	
40	C8WLC11	$ 17,474.02		$ 17,474.02	
41	C8WLC05	$ 17,474.17		$ 17,474.17	
42	C9RLC10	$ 17,601.95		$ 17,601.95	
43	C9MLC23	$ 20,545.88		$ 20,545.88	
44	C9MLC24	$ 21,057.80			
45	C9MLC26	$ 25,968.00			
46	TOTAL	$ 436,898.45		$ 385,996.01	
47					
48	Average	**$ 10,656.06**		**$ 10,432.32**	

E. 2.1 & 3.1 Engineering

Cell: A2
Comment: Engineering
Assumptions
Total charged to job.
Dedicated to Collocator
Not shared

Calculations
100% Nonrecurring dedicated
Total average expense of jobs with 2 highest and 2 lowest jobs removed

E. 2.1 & 3.1 Cable Racking

	A	B	C	D	E
1	**Cable Racking**	**2.1 Cageless**		**3.1 Caged**	
2	Version 1.0 Created 3/8/01, 12:59:26 PM				
3	Arizona	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
4	**Cable Racking Channel**				
5	Number of 10' Channels	9.5	1.3	8	2.5
6	Expense per 10' Channel	$ 74.52	$ 69.17	$ 74.52	$ 69.17
7	Total Material Expense	$ 707.96	$ 89.92	$ 596.17	$ 172.93
8	45 Day Labor Expense per foot	$ 24.06	$ 24.06	$ 24.06	$ 24.06
9	Total 45 Day Labor Expense	$ 2,285.70	$ 312.78	$ 1,924.80	$ 601.50
10	Total 45 Day Expense	$ 2,993.66	$ 402.70	$ 2,520.97	$ 774.43
11					
12	90 Day Labor Expense per foot	$ 21.93	$ 21.93	$ 21.93	$ 21.93
13	Total 90 Day Labor Expense	$ 2,083.35	$ 285.09	$ 1,754.40	$ 548.25
14	Total 90 Day Expense	$ 2,791.31	$ 375.01	$ 2,350.57	$ 721.18
15					
16					
17	**Cable Racking Ladder**				
18	Number of 10' Ladders	1.5	0.1		
19	Expense per 10' Ladder	$ 30.70	$ 23.76		
20	Total Material Expense	$ 47.24	$ 2.38		
21	45 Day Labor Expense per foot	$ 24.06	$ 24.06		
22	Total 45 Day Labor Expense	$ 370.15	$ 24.06		
23	Total 45 Day Expense	$ 417.39	$ 26.44		
24					
25	90 Day Labor Expense per foot	$ 21.93	$ 21.93		
26	Total 90 Day Labor Expense	$ 337.38	$ 21.93		
27	Total 90 Day Expense	$ 384.62	$ 24.31		
28					
29					
30	**Horn**				
31	Number of Horns	29.3	2.4	24.6	4.6
32	Expense per Horn	$ 13.93	$ 15.70	$ 13.93	$ 15.70
33	Total Material Expense	$ 407.75	$ 37.68	$ 343.37	$ 72.46
34	45 Day Labor Expense per Horn	$ 8.43	$ 8.43		
35	Total 45 Day Labor Expense	$ 246.74	$ 20.23		
36	Total 45 Day Expense	$ 654.49	$ 57.91		
37					
38					
39	90 Day Labor Expense per Horn	$ 7.00	$ 7.00	$ 7.00	$ 7.00
40	Total 90 Day Labor Expense	$ 204.88	$ 16.80	$ 172.53	$ 32.31
41	Total 90 Day Expense	$ 612.63	$ 54.48	$ 515.90	$ 104.77
42					

E. 2.1 & 3.1 Cable Racking

	A	B	C	D	E
1	**Cable Racking**	**2.1 Cageless**		**3.1 Caged**	
2	Version 1.0 Created 3/8/01, 12:59:26 PM				
3	Arizona	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
43					
44	**Pan**				
45	Amount of Pan	7.2	1.4	6.0	2.7
46	Expense for Pan	$ 26.31	$ 28.77	$ 26.31	$ 28.77
47	Total Material Expense	$ 188.21	$ 40.28	$ 158.49	$ 77.46
48	45 Day Labor Expense per Pan	$ 16.14	$ 16.14		
49	Total 45 Day Labor Expense	$ 1,154.63	$ 225.96		
50	Total 45 Day Expense	$ 1,342.84	$ 266.24		
51					
52	90 Day Labor Expense per Pan	$ 13.56	$ 13.56	$ 13.56	$ 13.56
53	Total 90 Day Labor Expense	$ 970.06	$ 189.84	$ 816.89	$ 365.08
54	Total 90 Day Expense	$ 1,158.27	$ 230.12	$ 975.38	$ 442.53
55					
56	**Other**				
57	Number of Systems Ladders	10.6	1	8.9	1
58	Expense per Systems Ladder	$ 4.91	$ 2.65	$ 4.91	$ 2.65
59	Total	$ 52.17	$ 1.59	$ 43.93	$ 3.05
60	Number of Brackets	17.7	10.8	14.9	20.77
61	Expense per Bracket	$ 12.05	$ 13.60	$ 12.05	$ 13.60
62	Total	$ 213.70	$ 146.85	$ 179.95	$ 282.41
63	Number of Fittings	51.1	35	43.0	67.31
64	Expense per Fitting	$ 8.04	$ 6.84	$ 8.04	$ 6.84
65	Total	$ 410.84	$ 239.38	$ 345.97	$ 460.34
66	Number of Insulators	3.7	1.6	3.1	3.08
67	Expense per Insulator	$ 1.04	$ 0.64	$ 1.04	$ 0.64
68	Total	$ 3.83	$ 1.02	$ 3.22	$ 1.97
69	Number of Cable Racking Kits	9.1	3.8	7.7	7.31
70	Expense per Cable Racking Kit	$ 60.15	$ 49.39	$ 60.15	$ 49.39
71	Total	$ 548.30	$ 187.68	$ 461.73	$ 360.92
72	Number of Miscellaneous Items	142.7	40	120.2	76.92307692
73	Expense per Miscellaneous Item	$ 0.10	$ 0.02	$ 0.10	$ 0.02
74	Total	$ 13.66	$ 0.79	$ 11.50	$ 1.51
75	Number of Support Items	33.4	8.2	28.1	15.76923077
76	Expense per Support Item	$ 7.55	$ 6.14	$ 7.55	$ 6.14
77	Total	$ 252.39	$ 50.38	$ 0.43	$ 0.43
78	Number of Nuts and Bolts	16.8	20.1	0.0	0
79	Expense per set of Nuts and Bolts	$ 0.47	$ 0.49	$ 0.47	$ 0.49
80	Total	$ 7.91	$ 9.87	$ -	$ -
81					
82	Grand Total Other	$ 1,502.80	$ 637.55	$ 1,046.75	$ 1,110.63
83					
84	Total Cable Racking Material	$ 2,806.71	$ 805.43	$ 2,144.77	$ 1,433.48
85					
86	Total 45 Day Cable Racking	$ 6,911.17	$ 1,390.84		
87	Total 90 Day Cable Racking	$ 6,449.62	$ 1,321.47	$ 4,888.60	$ 2,379.11

E. 2.1 & 3.1 Cable Racking

	A	B	C	D	E
1	**Cable Racking**	**2.1 Cageless**		**3.1 Caged**	
2	Version 1.0 Created 3/8/01, 12:59:26 PM				
3	Arizona	Major Jobs	Minor Jobs	Major Jobs	Minor Jobs
88					
89	Shipping	$ 392.63	$ 112.67	$ 300.03	$ 200.53
90	Tax 45 Day	$ -	$ -		
91	Tax 90 Day	$ -	$ -	$ -	$ -
92	Grand Total Cable Racking -45 day	$ 7,303.80	$ 1,503.51		
93	Grand Total Cable Racking -90 day	$ 6,842.25	$ 1,434.14	$ 5,188.63	$ 2,579.64
94					
95					
96	% of Jobs Requiring Major Cable Racking	50%		100%	
97	Average Number of Collocators in an Office	3		3	
98	Number of Bays to Spread Expense over	3			
99	Number of Bays in Standard Configuration	2			
100	% of Jobs Requiring Both Major Aerial and Major Cable Racking	73%		73%	
101					
102	% of Jobs Requiring some Cable Racking	88%		88%	
103					
104		45 Day	90 Day	90 Day	
105	Total Cable Racking 3 Bays	$ 2,643.03	$ 2,492.68	$ 3,455.12	
106					
107	% of Aerial Support used for Cable Racking	75%		75%	
108	Amount of Aerial Support assigned	$ 1,758.89	$ 1,541.70	$ 2,298.27	
109					
110					
111	**Total Expense for Cable Racking 2 Bays**	**$ 2,934.62**	**$ 2,689.59**	**$ 5,753.38**	
112					
113	**Additional Bay Expense**	**$ 1,467.31**	**$ 1,344.79**		
114					

E. 2.1 & 3.1 Cable Racking

Cell: A1
Comment: Cable Racking
Assumptions
Major cable racking job is a job requiring 4 or more racking strands.
All other jobs with cable racking costs are minor jobs
Minor jobs will occur on all collocations with the same frequency as COVAD jobs
The frequency of the need for major cable racking jobs is directly related to the frequency for the need for major aerial support jobs
The COVAD jobs reflect a reasonable relationship between major cable racking jobs and major aerial support jobs for all offices
Cable racking costs will be determined on a per collocator basis

Calculations
Cost for cable racking = B * average cost for a major cable racking job + ((total number of jobs with cable racking/total number of jobs)- B)* coverage cost of minor cable racking jobs, Where: B=(Number of major cable racking jobs/ Number of major aerial support jobs)*% of the time a major aerial support job is required/# collocators

	A	B	C	D
1	**Space Rent**			
2	**Investment**			
3	Version 1.0 Created 3/8/01, 12:59:26 PM			
4	Arizona			
5	Land Investment		**$7.20**	
6	Building Investment		**$163.24**	
7				
8				
9	**SUMMARY OF NUMBERS**			
10	Capital $ for RRCN			
11	Typical Central Office Model	=	8000	RSF
12	RS Means Median Unit Cost 4500 GSF	=	$135.00	GSF
13	Building Construction RRCN	=	$130.82	RSF
14	Site Work & Landscape	=	$18.86	RSF
15	97 Construction Cost Subtotal	=	$149.68	RSF
16	RS Means 97 to 98 Cost Escalation	=	2.50%	
17	98 Construction Cost Subtotal	=	$153.42	RSF
18	Land Purchase 1 Acre	=	$7.20	RSF
19	Architectural Fee 15%	=	$24.09	RSF
20	USWC Project Management 5%	=	$9.24	RSF
21	Typical CO Project RRCN	=	$193.95	RSF
22	Mechanical & Electrical Delivery Cost Adjustment	=	($23.51)	RSF
23	Typical CO Project ARRCN	=	$170.44	RSF
24	**RSF = Rentable Square Foot			
25	**RRCN = Rentable Reconstruction Cost New			
26	**ARRCN = Adjusted Rentable Reconstruction Cost New			

	A	B	C	D	E	F
1	Version 1.0 Created 3/8/01, 12:59:26 PM					
2						
3	**Quotation Preparation Fee**					
4						
5					NonRecurring Expense	
6						
7		2.3 Quotation Preparation Fee - Cageless			$ 3,174.25	
8						
9		3.4 Quotation Preparation Fee - Caged			$ 3,451.33	

	A	B	C	D	E	F	G	H	I	J
1	**Costs for A & B DC Feeds to equipment,**									
2	**in collocated space, from BDFB or power board,**									
3	**Averaged for 5 actual sites**									
4	Version 1.0 Created 3/8/01, 12:59:26 PM									
5	Arizona	**Costs for Caged Physical Collocation**								
6	**Site**	**20 A**	**30 A**	**40 A**	**60 A BDFB**	**60 A PBD**	**100 A**	**200 A**	**300 A**	**400 A**
7										
8	Bellevue Sherwood, WA	$55.83	$56.75	$62.30	$89.22	$48.23	$79.56	$93.30	$157.84	$176.82
9	Seattle Duwamish, WA	$54.63	$54.69	$79.80	$89.26	$73.32	$84.89	$164.46	$286.67	$424.97
10	Westminster, CO	$53.34	$78.18	$78.20	$87.65	$72.56	$83.85	$164.68	$284.77	$422.76
11	Crystal, MN	$74.57	$74.60	$84.00	$143.42	$80.92	$140.27	$279.45	$417.32	$554.59
12	Portland Alpine, OR	$50.88	$56.43	$81.94	$82.01	$50.60	$75.44	$146.15	$168.19	$287.67
13										
14	Average $/ft	$57.85	$64.13	$77.25	$98.31	$65.13	$92.81	$169.61	$262.96	$373.36
15	**Averaged Cost**	**$4,785**	**$5,305**	**$6,390**	**$8,132**	**$11,926**	**$16,995**	**$31,059**	**$48,154**	**$68,372**
16	Shipping	$267.78	$296.82	$357.55	$455.06	$667.35	$950.97	$1,737.95	$2,694.52	$3,825.82
17	Tax	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
18	Total	$5,053	$5,601	$6,747	$8,588	$12,594	$17,946	$32,797	$50,849	$72,198
19										
20										
21	**Average 60 A Caged Physical feed cost**				**$10,580**					
22				Shipping	$592.02					
23				Tax	$ -					
24	**Assumptions**			Total	**$11,172.17**					
25	inflation/apprec. rate	2.0%								
26	appreciated year	1999								
27	base cost year	1999								
28	avg <60 A Physical run	83	ft.							
29	avg Virtual/Cageless run	71	ft.							
30	avg >60 A run	183	ft.							
31	60 A feeds from BDFB	35%		**Installation**						
32	1/0 thru 4/0 - #2 H-Tap	$4.66	ea.	$40.07	ea.					
33	350-750 kcmil - 1/0-4/0 H-Tap	$15.22	ea.	$55.20	ea.					
34	350-750 kcmil - #2 H-Tap	$29.32	ea.	$40.07	ea.					
35	kcmil - kcmil H-Tap	$30.54	ea.	$55.20	ea.					
36	#6 AWG lug	$0.24	ea.	$27.83	ea.					
37	#4 AWG lug	$1.22	ea.	$27.83	ea.					
38	#2 AWG lug	$2.26	ea.	$40.07	ea.					
39	1/0 lug	$2.68	ea.	$40.07	ea.					
40	2/0 lug	$4.15	ea.	$40.07	ea.					
41	4/0 lug	$5.80	ea.	$40.07	ea.					
42	350 kcmil lug	$10.72	ea.	$55.20	ea.					
43	500 kcmil lug	$12.44	ea.	$55.20	ea.					
44	750 kcmil lug	$28.76	ea.	$55.20	ea.					
45	#6 AWG cost	$0.55	/ft.	$3.68	/ft.					
46	#4 AWG cost	$0.88	/ft.	$4.56	/ft.					
47	#2 AWG cost	$1.97	/ft.	$4.56	/ft.					
48	1/0 AWG cost	$3.12	/ft.	$6.46	/ft.					
49	2/0 AWG cost	$3.31	/ft.	$6.46	/ft.					
50	4/0 AWG cost	$4.67	/ft.	$6.46	/ft.					
51	350 kcmil cost	$4.82	/ft.	$12.00	/ft.					
52	500 kcmil cost	$7.16	/ft.	$12.00	/ft.					
53	750 kcmil cost	$12.54	/ft.	$21.41	/ft.					
54	25 A fuse	$17.51	ea.	$9.90	ea.					
55	30 A fuse	$18.22	ea.	$9.90	ea.					
56	40 A fuse	$18.94	ea.	$9.90	ea.					
57	50 A fuse	$19.65	ea.	$9.90	ea.					
58	60 A fuse	$20.37	ea.	$9.90	ea.					

	A	B	C	D	E	F	G	H	I	J
59	75 A fuse	$21.29	ea.	$9.90	ea.					
60	75 A fuse/brkr avg	$47.40	ea.	$21.79	ea.					
61	80 A fuse/brkr avg	$48.70	ea.	$21.79	ea.					
62	90 A fuse/brkr avg	$75.15	ea.	$21.79	ea.					
63	100 A fuse/brkr avg	$92.40	ea.	$21.79	ea.					
64	125 A fuse/brkr avg	$104.75	ea.	$21.79	ea.					
65	150 A fuse/brkr avg	$116.75	ea.	$21.79	ea.					
66	200 A fuse/brkr avg	$148.00	ea.	$21.79	ea.					
67	250 A fuse/brkr avg	$179.00	ea.	$21.79	ea.					
68	300 A fuse/brkr avg	$218.15	ea.	$21.79	ea.					
69	400 A fuse/brkr avg	$235.80	ea.	$21.79	ea.					
70	500 A fuse/brkr avg	$273.75	ea.	$21.79	ea.					
71	600 A fuse/brkr avg	$307.50	ea.	$21.79	ea.					
72	H-Tap covers	$53.98	/job							
73	miscellaneous material costs	$183.13	/job							
74	Nuts & Bolts for Power	$9.14	/job							
75	Alarm fuses	$17.62	/job							
76	Heat Shrink	$17.48	/job							
77	Cable Tags	$79.25	/job							
78	BDFB loop drop	0.25	V							
79	PBD loop drop	1.00	V							

	A	B	C	D	E	F	G
1	**Costs for Grounding feed and CLGB to CLEC Area,**						
2	**in collocated space, from nearest COGB,**						
3	**Averaged for 5 actual sites**						
4	Version 1.0 Created 3/8/01, 12:59:26 PM						
5	Arizona	**Cost/ft.**					
6	**cable used**	**# 2 AWG**	**1/0 AWG**	**4/0 AWG**	**350 kcmil**	**500 kcmil**	**750 kcmil**
7							
8	Denver Sullivan	$10.36	$18.67	$21.00	$27.94	$30.78	$46.42
9	Burnsville, MN	$8.43	$13.81	$15.72	$22.00	$24.57	$37.75
10	Phoenix	$7.90	$12.47	$14.27	$20.35	$22.85	$35.36
11	Seattle	$8.05	$12.85	$14.68	$20.82	$23.34	$36.04
12	Portland Atlantic	$8.70	$14.49	$16.46	$22.83	$25.43	$38.96
13							
14	**Average $/ft.**	**$8.69**	**$14.46**	**$16.43**	**$22.79**	**$25.40**	**$38.91**
15	Shipping	$0.44	$0.73	$0.83	$1.15	$1.28	$1.96
16	Tax	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
17	**Total**	**$9.13**	**$15.18**	**$17.25**	**$23.94**	**$26.67**	**$40.87**
18							
19	(averaged costs are appreciated for inflation if costs are not from the current year)						
20	**Average Cageless Cost**	**$660**	+ 2 ft x avg #2 AWG $/ft from above for each additional bay				
21							
22							
23	**Assumptions**						
24	inflation/apprec. rate	2%					
25	appreciated year	1999					
26	base cost year	1999		**Installation**			
27	green #6 AWG cost	$0.67	/ft.	$3.68	/ft.		
28	green #2 AWG cost	$2.19	/ft.	$4.56	/ft.		
29	green 1/0 AWG cost	$3.12	/ft.	$6.46	/ft.		
30	green 4/0 AWG cost	$4.67	/ft.	$6.46	/ft.		
31	green 350 kcmil cost	$4.82	/ft.	$12.00	/ft.		
32	green 500 kcmil cost	$7.16	/ft.	$12.00	/ft.		
33	green 750 kcmil cost	$8.80	/ft.	$21.41	/ft.		
34	1/0 thru 4/0 - #6 H-Tap	$4.66	ea.	$40.07	ea.		
35	350-750 kcmil - 1/0-4/0 H-Tap	$15.22	ea.	$55.20	ea.		
36	350-750 kcmil - #2 H-Tap	$29.32	ea.	$40.07	ea.		
37	kcmil - kcmil H-Tap	$30.54	ea.	$55.20	ea.		
38	#6 AWG lug	$0.24	ea.	$27.83	ea.		
39	#2 AWG lug	$2.26	ea.	$40.07	ea.		
40	1/0 lug	$2.68	ea.	$40.07	ea.		
41	4/0 lug	$5.80	ea.	$40.07	ea.		
42	350 kcmil lug	$10.72	ea.	$55.20	ea.		
43	500 kcmil lug	$12.44	ea.	$55.20	ea.		
44	750 kcmil lug	$28.76	ea.	$55.20	ea.		
45	H-Tap covers	$3.37	/job				
46	miscellaneous material costs	$45.78	/job				

E. 3.1 Grounding - Cage

	A	B	C	D	E	F	G
23	**Assumptions**						
47	Nuts & Bolts for Grounding	$2.28	/job				
48	Heat Shrink	$4.37	/job				
49	Cable Tags	$19.81	/job				
50	CLGB cost	$125					
51	E&I 357C default factor	1.5195					
52	#2 used for:	Cageless & Virtual					
53	#2&1/0 avg cage size	100	ft2				
54	4/0 avg cage size	200	ft2				
55	350 avg cage size	300	ft2				
56	500 avg cage size	400	ft2				
57	750 avg cage size	500	ft2 +				
58	cage ground size	6	AWG				
59	# cage grounders	2					
60	avg run for cageless gnd	76					

E. 4.1 EQUIPMENT BAY

	A	B	C
1	Version 1.0 Created 3/8/01, 12:59:26 PM		
2	Arizona		
3	**Virtual Expanded Interconnection (VEIC) - Shelf**		
4	**Investment**		
5			
6			
7			
8	A	Iron Work	$255.00
9	B	Power Panel	$499.00
10	C	Total (A+B)	$754.00
11	D	Utilization	85%
12	E	Investment With Utilization (C/D)	$887.06
13	F	Number of Shelves Per Rack	6
14	G	Material Price Per Shelf (E/F)	$147.84
15	H	Sales Tax	$0.00
16	I	Material Price Per Shelf (E/F)	**$147.84**

	A	B	C	D	E
1					
2	**USWEST 1999 CO-LOCATION LABOR RATES PER HALF HOUR**				
3	**Expense**				
4	Version 1.0 Created 3/8/01, 12:59:26 PM				
5	Arizona				
6		1999	1999		
7		STRAIGHT TIME	TIME & 1/2 RATE		
8		PER HALF HR.	PER HALF HR.		
9					
10	P42-DSOC MTCE./TRAINING	**$20.27**	**$27.12**	maintenance or training	
11	P70-QUALITY INSPEC./INSTALL.	**$23.11**	**$29.76**	instector or installation	
12	E20-DETAIL ENGINEERING	**$21.87**	**$28.23**		
13					
14					
15	** Provided by Doreen Smith				
16					
17					
18	**P42 CENTRAL OFFICE/TRANSMISSION/SIGNALLING EQUIP. MAINTENANCE**				
19	(Account 6534.11)				
20					
21	Used for work and costs associated with repairing, rearranging,				
22	maintaining, and acceptance testing local and toll Central Office				
23	switching and power equipment, and transmission and signalling				
24	equipment. Shown below are details for:				
25					
26	Central Office Equipment Maintenance functions:				
27	- Repairing, rearranging, and maintaining local switching equipment				
28	requiring circuit analysis				
29	- Performing the inventory of Central Office equipment and network				
30	facilities for the purification of records for mechanized systems				
31	- Testing and accepting Central Office equipment				
32	- Performing processing activities for the local Central Office				
33	maintenance effort				
34	- Typical activities include:				
35	- Logging trunk orders, service orders, cable transfers, line				
36	transfers, and Central Office estimates				
37	- Referring troubles to local Central Office maintenance forces				
38	- Ordering tools and local Central Office maintenance materials				
39	- -Performing other similar local Central Office maintenance				
40	work				

P42 CENTRAL OFFICE/TRANSMISSION/SIGNALLING EQUIP. MAINTENANCE (Cont'd)

Transmission and Signalling Equipment Maintenance functions:

- Repairing, rearranging, and maintaining transmission and signalling equipment
- Repairing, rearranging, and maintaining circuits, carrier (repeater) and radio equipment requiring circuit analysis at Central Office or remote locations
- Repairing, rearranging, and maintaining testboards and local test desks
- Performing circuit analysis at manual toll, private, and special service test desks
- Performing the inventory of Central Office equipment and network facilities for the purification of records for mechanized systems
- Performing surveillance, analysis, repair, maintenance, and acceptance of Automated Transmission Terminal System components
- Testing circuit equipment in connection with trouble clearance, routine maintenance, and circuit order activity
- Performing work activities associated with placing trunks and circuits into service
- Rearranging circuit equipment (e.g., VF patch board) to restore service
- Repairing, rearranging, maintaining, and accepting Central Office power equipment requiring circuit analysis
- Performing processing activities for the Central Office transmission and signalling equipment maintenance effort
- Typical activities include:
  - Complying and preparing service measurement reports
  - Ordering tools and Central Office maintenance materials
  - Processing all types of transmission and signalling equipment trouble reports
  - Logging trunk orders, toll service orders, cable transfers, line transfers, and Central Office estimates
  - Processing and/or filing layout records, technical documents, and Central Office equipment and location records
  - Selecting available equipment for assignment to circuits after receipt of special service or trunk orders

Exclusions:

- For testing circuits using Outside Plant conductors or radio channels at testboards or other Central Office equipment locations, see PWCC P40.
- For testing of local exchange and special service circuits from a local test desk and performing associated processing activities, see PWCC P10.
- For testing of trunks and related equipment and facilities from toll testboards on mechanized test systems (e.g., CAROT) and performing processing activities, see PWCC P40.

P70 CENTRAL OFFICE EQUIPMENT INSTALLATION

(Account 6534.11)

Used for work and costs associated with the following Central Office Equipment Installation functions:

- Installing Central Office equipment including test desks, frames, and power equipment
- Performing processing activities

Note:

- This PWCC should be assigned only to employees performing Central Office installations in lieu of vendors.

E20 NETWORK AND CENTRAL OFFICE PLANNING AND ENGINEERING

(Account 6535.11)

Used for work and costs associated with tactical planning and design engineering for the Network and Central Offices. Included are:

Central Office Switching

Tactical planning and design engineering for analog and digital electronic switching; for local, toll, tandem, and operator systems; and for equipment space, power, distributing frame, alarm/surveillance, network switching, technical service, maintenance, and network plug-in administration.

Transmission

Tactical planning and design engineering for transmission systems (radio, carrier, and multiplex systems) for interoffice facilities.

Note:

For transmission systems associated with local loop, see PWCC E30.

Trunking

Tactical planning and design engineering for exchange and toll trunking requirements for message circuits.

F. Expense Factors

	A	B	C	D	E	F	G
1	Version 1.0 Created 3/8/01, 12:59:26 PM						
2							
3	**Factor Description**	***Arizona***					
4		**RTU**					
5	**Digital Electronic Expense - RTU 377C**	0.000000	Not Used				
6	***Direct Costs***						
7							
8	***Directly Assigned***						
9		**Direct**					
10	**Product Management Expense**	0.033181					
11	**Sales Expense**	0.010969					
12	**Product Advertising Expense**	0.000000					
13	**Business Fees (Other Operating Taxes)**	0.001784					
14	***Directly Assigned Costs***						
15							
16	***Total Direct***						
17							
18	***Directly Attributed***	**Attributed**					
19	**Network Operations**	0.048556					
20	**Network Support Assets**	0.015592					
21	**General Support Assets**	0.083637					
22	**General Purpose Computers**	0.035618					
23	**Uncollectible - Interconnect**	0.000982					
24	**Accounting and Finance Expense**	0.008723					
25	**Human Resources Expense**	0.008422					
26	**Information Management Expense**	0.059798					
27	**Intangibles**	0.002770					
28							
29							
30							
31							
32	***Common***	**Common**					
33	**Executive Expense**	0.006719					
34	**Planning Expense**	0.000579					
35	**External Relations Expense**	0.009488					
36	**Legal Expense**	0.006215					
37	**Other Procurement Expense**	0.002352					
38	**Research and Development Expense**	0.000036					
39	**Other General and Admin Exp**	0.018326					
40							
41							
42							
43							
44	These Factors are calculated by the Factors Module of CM.						
45	See the initial screen or the User Manual for instructions on making changes that effect these factors.						
46	These Factors are used in section B.						

F. Expense Factors

Cell: A5
Comment: The Switching Right-To-Use (RTU) factor estimates the expensed RTU switching fees that make up a portion of the annual costs associated with digital switches. The factor numerator is based on the field reporting code (FRC) of 377M (Digital Electronic Switching Maintenance) and expenditure type codes of 61A (upgrades of operating system RTU), 61C (recurring RTU fees), and 61F (upgrades of application RTU). The denominator consists of the ending balance for FRC 377C (in Account 2212, Digital Electronic Switching).

Cell: A8
Comment: Directly assigned factors are used to directly assign expenses to a product or service. That is, accounting records allow expenses to be tracked down to a particular product or service.

Cell: A10
Comment: Product Management Expense Factor
Product Management Expense, account 6611: Product management includes 1) Rate and Tariff - Development which are the costs of providing new or revised tariff offerings, making studies in support of specific dockets and to identify and analyze costs for regulatory activities and 2) Market Forecast - Management Administration and Analysis which are the costs associated with analyzing all forecasts of current and future market conditions, presenting a detailed customer profile, establishing and tracking revenue objectives, as well as performing basic office services. Product management in a interconnect marketplace will be similar to that of the retail market. In fact it will be like the product management that U S WEST performs today in its Carrier market unit which manages wholesale services such as switched and dedicated access products. In this model, U S WEST used the cost of its carrier marketing product management product group. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A11
Comment: Sales Expense Factor
Sales Expense, account 6612: Included in this factor are costs incurred with performing sales contact work, servicing and implementation activities for the purpose of selling products and services to accounts in a particular market or segment. Sales expense in a interconnect marketplace will be similar to that of the retail market. In fact it will be like the Sales expense that U S WEST performs today in its Carrier market unit which manages wholesale services such as switched and dedicated access products. In this model U S WEST used the cost of its carrier marketing sales product group. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A12
Comment: Product Advertising Expense Factor
Product advertising expense, account 6613: Includes costs incurred in developing and implementing promotional strategies to stimulate the purchase of products and services. This excludes non product related advertising, such as corporate image, stock and bond issue and employment advertisements, which is included in the appropriate functional accounts. Product advertising is not included in U S West's TELRIC studies. Product advertising is avoided for interconnect services and set to zero.

Cell: A13
Comment: The Business Fees factor estimates the expenses associated with other operating taxes. The factor numerator is based on account 7240 (Operating Other Taxes), specifically 7240.2 through 7240.9. (Reference: Factor Development - Section A1.) The sub accounts of .2 through .9 represent gross receipts taxes, cost of franchises, capital stock taxes, superfund taxes and other taxes. The denominator consists

of the sum of the Total Directly Assigned Expenses, Product Management Expense, and Sales Expense.

Business fees is calculated by multiplying the Total Investment Based Costs +Other Direct Expense Inputs + Product Management + Sales Expense + Product Advertising Expense by the Business fees factor.

Cell: A18
Comment: Directly attributed factors are used to indirectly assign or attribute expenses to a product or service. That is, accounting records do not track investments and expenses down to a product level. For example, switching equipment expenses and investments are used for a number of services. Since this equipment is shared by many products and services, the cost of switching cannot be directly assigned to any of them. However, it can be indirectly assigned or attributed through an allocation process.

Cell: A19
Comment: Network Operations
Network Operations: The numerator for this factor is Account 6532, 6534 and 6535.

Account 6532, includes costs incurred in network administration. This includes such activities as controlling traffic flow, administering traffic measuring and monitoring devices, assigning equipment and load balancing, collecting and summarizing traffic data, administering trunking and assigning interoffice facilities and circuit layout work.

Account 6534, includes costs incurred in the general administration of plant operations. This includes supervising plant operations, planning, coordinating and monitoring plant operations; and performing staff work such as developing methods and procedures, preparing and conducting training and coordinating safety programs.

Account 6535, includes costs incurred in the general engineering of the telecommunications plant which are not directly chargeable to an undertaking or project. This includes developing input to the fundamental planning process, performing preliminary work or advance planning in connection with potential undertakings, and performing special studies of an engineering nature.

These expenses are adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A20
Comment: Network Support Assets
Network Support Assets: Included in this factor are accounts 2112-2116.

Account 2112, Motor Vehicles includes the original cost of motor vehicles of those types which are designed and routinely licensed to operate on public streets and highways.

Account 2113, Aircraft includes the original cost of company owned aircraft and any associated equipment and furnishing installed as an integral part of the aircraft.

Account 2114, Special Purpose Vehicles includes the original cost of special purpose vehicles. Special purpose vehicles are self propelled and are therefore independent upon another vehicle's engine for power.

Account 2115, Garage Work Equipment includes the original cost of tools and equipment used to maintain items included in Accounts 2112, 2113, 2114. Items such as Air compressors, car hoists, garage jacks, gasoline pumps etc.

Account 2116, Other Work Equipment includes the original cost of power operated equipment, general purpose tools and other items of work equipment.

The investment in these accounts are converted to expenses to calculate a factor. This is done by multiplying the investment dollars by an Ad Valorem factor, and Capital Costs (Cost of Money, Income Taxes and Depreciation). These investments were also adjusted by a Current Cost to Book Cost ratio and TPI's, to bring expenses to study year.

Cell: A21
Comment: General Support Assets

General Support Assets: Included in this factor are accounts 2111, 2121-23,1220, 2681.1,.9, 2682.1.

Account 2111, Land includes the original cost of all land held in fee and of easements, and similar rights in land having a term of more than one year used for purposes other than the location of outside plant or externally mounted central office equipment.

Account 2121, Buildings includes the original cost of buildings, and the cost of all permanent fixtures, machinery, appurtenances and appliances installed as a part thereof. It shall include costs incident to the construction or purchase of a building and to securing possession and title.

Account 2123, Office Equipment includes the original cost of office equipment in offices, shops and all other quarters. Account 1220, Inventories includes the cost of material and supplies held in stock and inventories of goods held for resale or lease.

Account 2681.1,9, Land and Buildings and Other are: amounts recorded in this account at the inception of a capital lease shall be equal to the original cost, if known, or to the present value not to exceed fair value, at the beginning of the lease term, of minimum lease payments during the lease term, excluding that portion of the payments representing executory costs to be paid by the lessor, together with any profit thereon.

Account 2682.1, Land & Buildings, this account shall include the original cost of lease hold improvements made to telecommunications plant held under a capital or operating lease, which are subject to amortization treatment. The investment in these accounts are converted to expenses to calculate a factor. This is done by multiplying the investment dollars by an Ad Valorem factor, and Capital Costs (Cost of Money, Income Taxes and Depreciation) where applicable. These investments were also adjusted by a Current Cost to Book Cost ratio and TPI's, to bring expenses to study

Cell: A22
Comment: General Purpose Computers

General Purpose Computers: Included in this factor are accounts 2124, 2681.3 & 4 and 2682.2.

Account 2124, General Purpose Computers includes the original cost of computers and peripheral devices which are designed to perform general administrative information processing activities.

Account 2681.3 & 4 Computers and Computer Software Capital leases, includes the amounts recorded in this account at the inception of a capital lease shall be equal to the original cost, if known, or to the present value not to exceed fair value, at the beginning of the lease term, of minimum lease payments during the lease term, excluding that portion of the payments representing executory costs to be paid by the lessor, together with any profit thereon.

Account 2682.2 Computer Leasehold Improvements, this account shall include the original cost of lease hold improvements made to telecommunications plant held under a capital or operating lease, which are subject to amortization treatment. The investment in these accounts are converted to expenses to calculate a factor. This is done by multiplying the investment dollars by an Ad Valorem factor, and Capital Costs (Cost of Money, Income Taxes and Depreciation) where applicable. These investments were also adjusted by a Current Cost to Book Cost ratio and TPI's, to bring expenses to study year where applicable.

Cell: A23
Comment: Uncollectible - Interconnect
Uncollectible - Interconnect: included in this factor is Account 5301.4 & .5 and Account 5302.

Account 5301.4 Interstate - Carrier Access Services (Uncollectibles) include the accruals to the reserve to provide for the write-offs of uncollectible interstate operating revenues arising from CABS services.

Account 5301.5 Intrastate - Carrier Access Services (Uncollectibles) include the accruals to the reserve for the write-offs of uncollectible intrastate operating revenues arising from CABS services.

Account 5302 Uncollectible Revenue - Other this account shall be charged with amounts concurrently credited to account 1190, Other Accounts Receivable, or to Account 1191, Accounts Receivable Allowance - Other, when such allowance is maintained.

Cell: A24
Comment: Accounting and Finance Expense
Accounting and Finance Expense: Included in this factor is Account 6721, Accounting and Finance Expense. This includes the costs incurred in providing accounting and financial services. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A25
Comment: Human Resources Expense
Human Resources Expense: Included in this factor is Account 6723, Human Resources Expense. This includes the costs incurred in performing personnel administration activities such as Equal Employment Opportunity and Affirmative Action Programs, General Employment Services, Employee data for forecasting, planning and reporting etc. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A26
Comment: Information Management Expense
Information Management Expense, account 6724: Included in this factor are costs incurred in planning, developing, testing, implementing and maintaining data bases and application systems for general purpose computers. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

F. Expense Factors

Cell: A27
Comment: Intangibles

Intangibles, Account 2690: Includes the cost of organizing and incorporating the company, the original cost of government franchise, the original cost of patent rights, and other intangible property *having a life of* more than one year and uses in connection with the company's telecommunications. The investment in this account is converted to expense to calculate the factor. This is done by multiplying the investment dollars by Cost of Money & Income Tax factors. These expenses are also adjusted with inflation factors to bring expenses to study year.

Cell: A32
Comment: Common factors are developed for expenses that cannot be directly or indirectly assigned to a service but are needed for the operation of the business that provides the service (i.e., executive expense.)

Cell: A33
Comment: Executive Expense

Executive Expense, account 6711: Included in this numerator is executive expense which shall include costs incurred in formulating corporate policy and in providing overall administration and management. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A34
Comment: Planning Expense

Planning Expense, account 6712: Included in this factor are costs incurred in developing and evaluating long-term courses of action for the future operations of the Company. This includes performing corporate organization and integrated long-range planning, including management studies, options and contingency plans, and economic strategic analysis. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A35
Comment: External Relations Expense

External Relations Expense, account 6722: Included in this factor are costs incurred in maintaining relations with government, regulators, other companies and the general public. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A36
Comment: Legal Expense

Legal Expense, account 6725: Included in this factor are costs incurred in providing legal services. This includes conducting and coordinating litigation, providing guidance on regulatory and labor matters, preparing, reviewing and filing patents and contracts and interpreting legislation. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A37
Comment: Other Procurement Expense

Other Procurement Expense, account 6726: Included in this factor are costs incurred in procuring material and supplies, including office supplies. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A38
Comment: Research and Development Expense
Research and Development Expense, account 6727: Included in this factor are costs incurred in making planned search or critical investigation aimed at discovery of new knowledge. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

Cell: A39
Comment: Other General and Administrative Expenses
Other General and Administrative Expenses, account 6728: Included in this factor are costs incurred in performing general administrative activities not directly charged to the user, and not provided for in other accounts. This includes providing general reference libraries, food services, archives, general security investigation services, operating official private branch exchanges in the conduct of the business and telecommunications and mail services. These expenses are also adjusted with cost savings and inflation factors to bring expenses to study year.

G. Investment Factors

Version 1.0 Created 3/8/01, 12:59:26 PM								
				CAPCOST FACTORS				
		Cost of Money	0.1036627				**State:**	**Arizona**
		Cost of Debt	0.0709					
		Debt Ratio	0.383					
		Discount Rate	0.1036627					
			Depreciation	**Cost of Money**	**Income Tax**	**Total_CAPCOST**	**Ad_Valorem**	**Maintenance**
Acct	**FRC**	**Account Name**	**A**	**B**	**C**	**D**	**E**	**F**
2111	20C	Land	0.000000	0.098554	0.047757	0.146311	0.013621	0.047153443
2212	164C	Motor Vehicles	0.102725	0.048762	0.023629	0.175116	0.013621	
2112	1364C	Aircraft	0.000000	0.000000	0.000000	0.000000	0.013621	
2114	464C	Spec. Purpose Vehicles	0.062112	0.060573	0.029353	0.152038	0.013621	
2115	264C	Garage Work Equipment	0.090511	0.058456	0.028326	0.177293	0.013621	
2116	564C	Other Work Equipment	0.079130	0.061092	0.029604	0.169827	0.013621	
2121	110C	Building	0.027775	0.076376	0.037010	0.141162	0.013621	0.047153443
2122	161C	Furniture	0.124603	0.050664	0.024551	0.199818	0.013621	
2123	261C	Office Equipment	0.154019	0.049872	0.024167	0.228058	0.013621	
2124	361C	General Purpose Comp.	0.194417	0.049037	0.023762	0.267216	0.013621	
2212	377C	Digital Switch	0.104715	0.045620	0.022106	0.172441	0.013621	0.028112375
2220	117C	Operator Systems	0.109955	0.044638	0.021631	0.176223	0.013621	0.036429778
2231	67C	Radio Microwave	0.083580	0.053043	0.025704	0.162327	0.013621	0.021684335
2232.1	157C	Digital Data System	0.123455	0.047407	0.022972	0.193834	0.013621	0.004234952
2232.2	257C	Pair Gain—Digital	0.108816	0.045747	0.022168	0.176732	0.013621	0.014309992
2232.2	257CS	Pair Gain—Digital	0.108816	0.045747	0.022168	0.176732	0.013621	0.013913047
2232.2	257CSP	Pair Gain—Digital	0.108816	0.045747	0.022168	0.176732	0.013621	0.013913047
2232.3	357C	Other Digital Equipment	0.108816	0.045747	0.022168	0.176732	0.013621	0.021897299
2232.3	357CS	Other Digital Equipment	0.108816	0.045747	0.022168	0.176732	0.013621	0.021500354
2232.4	457C	Pair Gain—Analog	0.137748	0.045291	0.021947	0.204985	0.013621	0.107233706
2232.5	57C	Other Analog Equipment	0.137748	0.045291	0.021947	0.204985	0.013621	0.186050961
2351	188C	Public Telephones	0.088608	0.063047	0.030552	0.182206	0.013621	
2362	858C	Chan. Term. Eq.	0.135294	0.065486	0.031733	0.232513	0.013621	0.068275
2411	1C	Poles	0.068818	0.055348	0.026821	0.150987	0.013621	0.005324757
2421.11,.21	52C	Aerial Cbl Metallic	0.114541	0.058342	0.028272	0.201155	0.013621	0.136398014
2421.11	42C	Aerial Drop	0.114541	0.058342	0.028272	0.201155	0.013621	0.136398014
2421.12,.22	852C	Aerial Cbl Nonmetallic	0.102491	0.056409	0.027335	0.186234	0.013621	0.017003366
2422.11,.21	5C	UG Cbl Metallic	0.077606	0.059523	0.028844	0.165973	0.013621	0.044297215
2422.12,.22	85C	UG Cbl Nonmetallic	0.090735	0.061141	0.029628	0.181504	0.013621	0.018092899
2423.11,.21	45C	Buried Cbl Metallic	0.094716	0.059954	0.029052	0.183722	0.013621	0.099529136
2423.11	35C	Buried Drop	0.094716	0.059954	0.029052	0.183722	0.013621	0.099529136
2423.12,.22	845C	Buried Cbl Nonmetallic	0.066576	0.058761	0.028474	0.153811	0.013621	0.016432031
2424.11,.21	6C	Submarine Cbl., Exch., Metallic	0.082492	0.063253	0.030651	0.176396	0.013621	0.014957935
2424.12,.22	86C	Submarine Cbl., Exch., Nonmetallic	0.127771	0.067477	0.032698	0.227946	0.013621	0.014957935
2426.1	62C	Intrabuilding Cbl., Exch., Metallic	0.060308	0.061449	0.029777	0.151534	0.013621	0.075691878
2426.2	862C	Intrabuilding Cbl., Exch., Nonmetallic	0.099816	0.063993	0.031010	0.194819	0.013621	0.023574656
2431	3C	Aerial Wire	0.140449	0.081529	0.039507	0.261485	0.013621	0.018400804
2441	4C	Conduit System	0.022759	0.063957	0.030993	0.117709	0.013621	0.005477852
	257CP	Pair Gain—Digital	0.108816	0.045747	0.022168	0.176732	0.013621	0.014310
These are investment factors. They are applied to investments to calculate investment related costs.								
Please refer to the user manual before adjusting these factors.								
Depreciation, post tax income and income tax expense are calculated by the CAPCOST module of ICM.								
To effect changes in these factors, adjust the CAPCOST input parameters.								
Ad Valorem and maintenance are calculated by the factors module. Adjust the input parameters to the factors module to cause changes in these Factors.								
These factors are applied in the Investment Cost Calculation spreadsheet.								
		Sales Tax Factor	**0**					

G. Investment Factors

Cell: D7
Comment: Depreciation

Two types of depreciation are involved in the determination of recurring capital costs - book depreciation and tax depreciation. Book depreciation is the repayment of invested capital and is a direct component of capital costs. On the other hand, tax depreciation is not a component of capital cost, but is a schedule of expense deductions used in determining income tax expense. Both depreciation amounts must be separately calculated because most likely, they will differ in timing and amount.

Book depreciation amounts are determined by: (1) total investment, less net salvage, in assets: and (2) estimated life characteristics. The life characteristics are average economic life and survivor shape that are either anticipated or actually experienced at U S West Communications. Several methods are available to calculate book depreciation, however at U S West Communications, the straight-line equal-life group (ELG) method is applied. For service costs studies, ELG allows the depreciation amounts per unit to be "deaveraged" within each vintage of a category.

Tax depreciation is of interest because of its effect on income taxes. Tax depreciation is calculated separately from book depreciation because amounts and timing will differ from book depreciation. This is because, for example, income tax regulations permit using accelerated tax depreciation on most new investments. With accelerated tax depreciation, tax deduction amounts are claimed in greater amounts during the earlier years of an asset's life than during the later years.

To summarize, book depreciation repays capital and is a component cost; whereas, tax depreciation determines the expense deduction used in determining income tax liability.

Cell: E7
Comment: Post Tax Income (Return) (Cost Of Money)

Although invested capital can be repaid in various ways over its life, the capital repayment required will always be the same. However, the cost for the use of this capital varies directly with the time it takes to pay it back. An analogous situation for individuals would be the interest costs on the remaining balance of a home mortgage, which depend on the length of the mortgage. For example, more total interest is paid on a 30-year mortgage than on a mortgage lasting 25 years.

In cost studies, these interest costs are the return owed the investors for the use of their capital, and the company would need to pay this return until capital is fully repaid. The sum of the capital repayment and the associated return is called the capital recovery cost. Of course, in actual practice, investors are partially paid back directly (dividends), and the remaining capital repayment (retained earnings) is reinvested in new plant on behalf of them.

Because the assumed rate is the interest cost of an investment, it is often called the cost of money. And this cost of money is really a composite of the different returns for debt and equity capital. The proportion of debt and equity in the company's capital structure is therefore expressed as the debt ratio, and is used to calculate the composite cost of money as follows:

COMPOSITE COST OF MONEY = (DEBT RATIO X % COST OF DEBT)+(EQUITY RATIO X % COST OF EQUITY)

WHERE; EQUITY RATIO = (1-DEBT RATIO)

The composite cost of money is then used to calculate a schedule of equal payments made over time to repay both capitalized amounts, and a return amount to the investor. Even though each payment is the same, the apportionment between repayment of invested capital and return to the investor changes. The share representing invested capital repaid increases with each payment, and therefore, return to the investor decreases with each payment. Likewise, the principle portion of a home mortgage monthly payment increases each month, and the interest portion declines, even though, the total monthly payment remains the same.

The amount of money representing the return to the investors is called Post Tax Income. The title "post tax income" is somewhat of a misnomer however, since only return on equity is truly post tax income; return on debt is applied as a reduction to revenue thereby reducing taxable income used to compute income tax expense.

Cell: F7
Comment: Income Tax Expense

G. Investment Factors

Along with capital repayment and return, income taxes are incurred on the return required for the equity portion of the capital. Income taxes are involved because federal and state tax regulations provide for taxing remaining income after payment of operations costs and other deductible amounts. These income taxes are then a portion of the revenue required to meet the capital costs of the undertaking.

Income tax expense does not reflect the actual taxes U S West pays; but instead, it represents the taxes that are reported as paid on the income statement. The difference between the income tax expense and the taxes owed (paid) is due to the treatment of accelerated depreciation.

Cell: G7
Comment: Total Capital Costs
In summary, total capital costs consist of three components: capital repayment (depreciation), return (post tax income) and income tax expense. The sum of the first two components, depreciation and post tax income, has been defined as capital recovery. The present worth of the capital costs is therefore the sum of the present worth of the capital recovery costs and the present worth of the tax expenses.

Cell: H7
Comment: The Ad Valorem Tax Factor is used to provide an estimate of the Ad Valorem tax costs that are associated with investments. It was developed for use in estimating the total operating expense associated with central office equipment. public coin equipment, and outside plant equipment. The data sources utilized for this are (numerator) Account 7240.1 Property Taxes and (denominator) Account 2001 Total Telephone Plant in Service.

Cell: I7
Comment: There are 23 Maintenance Factors. Each of these maintenance factors are developed on a state by state basis using expenses and investments relative to the account under study.

Maintenance factors are developed by taking the adjusted levels of 'M' expense dollars and dividing them by adjusted investment associated with a particular account. Power, subscriber line testing and trunk testing factors are added to most accounts to get the final maintenance factor. Maintenance expense is calculated by multiplying the maintenance factor times total investment for an account under study.

Cell: C55
Comment: Sales Tax Factor
The purpose of the Sales Tax Factor is to provide an estimate of the sales tax costs that are associated with investments. The factor can be used, in conjunction with other factors and data; to develop total installed investment.

SCOPE:
Sales Tax Factors are provided for state specific, and U. S. West application.

SUMMARY:
These factors are provided by U.S. West Corporate Tax Department and represent total tax paid (state and local combined) divided by total taxable revenues from returns.

APPLICATION:
The Sales Tax Factor was developed for use in estimating the total installed investment associated with central office equipment, public coin equipment, and outside plant equipment. The Sales Tax Factor is applied to investments with other loading factors.

H. Land and Building Factors

CENTRAL OFFICE LAND AND BUILDING
These are not calculated in the Model
1999

	BLDG TO SWITCH FACTOR	BLDG TO CIRCUIT FACTOR	LAND TO SWITCH FACTOR	LAND TO CIRCUIT FACTOR
Arizona	0.05	0.0387	0.0033	0.0025

This data is used by the C. Investment Cost Calculation spreadsheet to calculate the land and building investments associated with switching equipment and circuit equipment.

H. Land and Building Factors

Cell: A2
Comment: LAND & BUILDING
Overview

DESCRIPTION
The purpose of this study is to develop factors to estimate land investments and building investments which are capitalized as part of central office switching equipment and circuit equipment. These factors can be used, in conjunction with other factors and data, to develop total installed investments.

SCOPE
The Land Factors for switch and circuit, and the Building Factors for switch and circuit, have been developed on a state specific basis, and as a U S WEST Composite.

SUMMARY OF METHODOLOGY
The study reflects forward looking land and building investments as a percent of the central office switching investment and circuit investment. The four factors that are developed for each state are:

1. Land Factor for Switch
2. Land Factor for Circuit
3. Building Factor for Switch
4. Building Factor for Circuit

The process to calculate land and building factors is as follows:
A. Identify land, building, switching and circuit Investments and other data by state.
B. Calculate total digital central office land and building investments associated with digital central offices.
C. Convert total digital central office land and building investments to current cost of the investment using the CCBC Ratios.
D. Calculate land and building investments for the space that is actually used for digital switching and circuit equipment.
E. Calculate digital switching and circuit land and building factors.

This process is described in detail in sections A through E, below.

A. Identify land, building, switching and circuit Investments and other data by state.

The following Investments data is required to calculate the land and building factors:

Total Land and Building Investments.
Total digital switch and circuit equipment investments.

The following ratios are required to covert total investments to that related to switching and circuit equipment:

Assignable unoccupied central office space ratios.
This ratio was developed by totaling the non-assignable space and the assignable space and dividing the result into the assignable unoccupied space.
Ratio of Digital Central offices space to total building space.
Ratios of Switch to total building and Circuit to total building.

H. Land and Building Factors

Current cost to book cost ratios (CCBC) are required to convert booked investments to current cost of placing the investments. They are as follows:

CCBC ratios for land and building investments.
CCBC ratios for digital switch and circuit equipment investments.

Sources of the data inputs are shown on the spreadsheet.

B. Calculate total digital central office land and building investments associated with digital central offices.

The study calculates total digital central office land and building investments associated with digital central offices by multiplying the ratio of digital central offices space to total building space times the total land and building investments. The calculations are as follows:

Total Digital Central Office Land Investment = Ratio Of Digital Central Offices Space To Total Building Space X Total Land Investment

Total Digital Central Office Building Investment = Ratio Of Digital Central Offices Space To Total Building Space X Total Building Investment

C. Convert total digital central office land and building investments to current cost of the investment using the CCBC Ratios.

The calculations are as follows:

Current Cost Digital Central Office Land Investment = Total Digital Central Office Land Investment X CCBC (Land)

Current Cost Digital Central Office Building Investment = Total Digital Central Office Building Investment X CCBC (Bldg)

D. Calculate land and building investments for the space that is actually used for digital switching and circuit equipment.

The study calculates digital switching and circuit land and building investments adjusting the total digital central office land and building investments calculated in Step C by the assignable unoccupied central office space ratios and the ratios of switch to total building and circuit to total building. The

I. Run Data

	A	B	C	D	E
1	Version 1.0 Created 3/8/01, 12:59:26 PM				
2		**Run_Name**			
3	Run Name	1.0 Created 3/8/01, 12:59:26 PM			
4	StudyID		4694		
5		**State**			
6	State	Arizona			
7	**General Inputs**				
8	**1 Standard Collocation**	Standard			
9	Number of Bays in Standard Configuration		2	Standard_Array	
10	Number of Bays Cable Racking is Spread Over		3		
11	Number of Bays Miscellaneous Items are Spread Over		3		
12	Number of Bays Other Shared Items are Spread Over		3		
13	Number of DS0 Terminations		100		
14	Number of DS1 Terminations		28		
15	Number of DS3 Terminations		1		
16	% of Blocks that are 410 Blocks		0.9		
17	Apply Sales Tax to Contract Labor: 1=Yes, 0=No		0		
18	Shipping Rate		0.13989		
19	**2 Cageless Collocation**	Cageless			
20	Number of Cageless Collocators per office		3	Cageless_Array	
21	% of Jobs that Require Major Aerial Support		0.5		
22	% of Jobs Requiring Any Aerial Support		0.853658537		
23	% of Jobs Requiring Major Cable Racking		0.5		
24	% of Jobs Requiring Both Major Aerial and Major Cable Racking		0.730769231		
25	% of Jobs Requiring some Cable Racking		0.87804878		
26	**3 Caged Collocation**	Caged			
27	Number of Caged Collocators per office		3	Caged_Array	
28	% of Jobs that Require Major Aerial Support		1		
29	% of Jobs Requiring Any Aerial Support		0.853658537		
30	% of Jobs Requiring Major Cable Racking		1		
31	% of Jobs Requiring Both Major Aerial and Major Cable Racking		0.730769231		
32	% of Jobs Requiring some Cable Racking		0.87804878		
33					
34	**Quotation Preparation Fees**	qpf			
35	2.3 Quotation Preparation Fee - Cageless	$	3,174.25	qpf_array	
36	3.4 Quotation Preparation Fee - Caged	$	3,451.33		
37	4.3 Quotation Preparation Fee - Virtual	$	3,174.25		
38					
39	**1.1 Terminations**		Terminations		
40	Number of 410 Blocks		0.9	Blocks_410	
41	Expense per 410 Block	$	376.00		

	A	B	C	D	E
42	45 Day Labor Expense per 410 Block	$	229.85		
43	90 Day Labor Expense per 410 Block	$	182.89		
44	Number of 89 Blocks		0.1	Blocks_89	
45	Expense per 89 Block	$	85.46		
46	45 Day Labor Expense per 89 Block	$	229.85		
47	90 Day Labor Expense per 89 Block	$	182.85		
48	Number of DS1 Panels		1	DS1_Panels	
49	Expense per DS1 Panel	$	524.25		
50	45 Day Labor Expense per DS1 Panel	$	158.19		
51	90 Day Labor Expense per DS1 Panel	$	125.16		
52	Number of DS3 Connectors		2	DS3_Connectors	
53	Expense per DS3 Connector	$	9.07		
54	45 Day Labor Expense per DS3 Connector	$	9.45		
55	90 Day Labor Expense per DS3 Connector	$	6.38		
56	Number of DS0 Cable Feet		156.05	DS0_Cable	
57	Expense per DS0 Cable Foot	$	1.45		
58	Number of DS0 Cable Terminations		100.00		
59	45 Day Labor Expense per DS0 Cable foot	$	1.45		
60	90 Day Labor Expense per DS0 Cable foot	$	1.13		
61	Number of DS1 Cable Feet		115.47	DS1_Cable	
62	Expense per DS1 Cable Foot	$	1.13		
63	Number of DS1 Cable Terminations		28.00		
64	45 Day Labor Expense per DS1 Cable foot	$	1.66		
65	90 Day Labor Expense per DS1 Cable foot	$	1.27		
66	Number of DS3 Cable Feet		94.77	DS3_Cable	
67	Expense per DS3 Cable Foot	$	0.89		
68	Number of DS3 Cable Terminations		1.00		
69	45 Day Labor Expense per DS3 Cable foot	$	0.84		
70	90 Day Labor Expense per DS3 Cable foot	$	0.63		
71					
72	**1.2 Entrance Enclosure**				
73	**Entrance Enclosure-General**		Enclosure		
74	Underground Fiber Cable Per Ft		$1.03	Enclosure_Array	
75	Utility Hole		$6,487.54		
76	Cut & Replace Road Covering - Utility Hole		$1,997.60		
77	Cut & Replace Concrete Per Trench Ft. - Conduit		$12.36		
78	Backfill Utility Hole		$816.60		
79	Backfill Conduit Trench Per Trench Ft.		$5.21		
80	Conduit Per Ft.		$21.63		
81	Pumping Utility Hole		$499.96		
82	Pulling Fiber into Conduit Per Ft.		$1.36		
83	Innerduct Per Ft.		$2.66		
84	Fiber Cable Per Ft		$1.16		
85	Cable Rack Per Ft		$181.45		
86	Fiber Cable Splicing - Per Setup		$366.99		
87	Fiber Cable Splicing - Per Fiber Spliced		$16.32		
88	Fiber Distribution Panel		$1,394.72		
89	Single Fiber Jumper		$125.00		
90	Attenuator Per Fiber		$200.00		
91	Core Drill		$112.00		
92	Placing Fiber Cable on Cable Racking Per Ft		$2.39		
93	Distance from Manhole '0' to Cable Vault		108		
94	Distance between Manhole 1 and Manhole '0'		302		
95	Weighting of use of POI		60%		
96	Weighting of use of Existing Manhole = (1-%POI)		40%		
97	**Standard Entrance Enclosure**		Standard_Entrance		
98	Distance from POI to USW Manhole '0' (feet)		50	ndard_Entrance_Array	
99	Fibers required per Collocator		18		
100	Collocators per Utility Hole/Conduit/CO		3		

	A	B	C	D	E
101	Core Drills per manhole		2		
102	Number of Fiber Splice Setup		2		
103	Number of fibers spliced per CLEC		18		
104	Distance for New Cable Racking		20		
105	Distance Shared Cable Racking		130		
106	**Cross Connect Entrance Enclosure**		Xconnect		
107	Distance from POI to USW Manhole '0' (feet)		50	Xconnect_Array	
108	*Fibers required per Collocator*		12		
109	Collocators per Utility Hole/Conduit/CO		3		
110	Core Drills per central office		2		
111	Number of Fiber Splice Setup		2		
112	Number of fibers spliced per CLEC		12		
113	Number of Fiber Distribution Panel		2		
114	Distance of New Cable Racking		20		
115	Distance of Shared Cable Racking		130		
116	**Express Entrance Enclosure**		Express		
117	Distance from POI to Manhole '0' (feet)		50	Express_Array	
118	Core Drills per central office		2		
119	Collocators per Utility Hole/Conduit/CO		3		
120	Distance from POI to Cable Vault (feet)		150		
121	Distance for New Cable Racking		20		
122	Distance for Existing Cable Racking		130		
123					
124	**2 Overall Aerial Support - Cageless**		Aerial_Major	Aerial_Minor	
125	Aux Frame Channel - Number of 10 foot channels		60	7	Aux
126	Aux Frame Channel - Number of 20 foot channels		7	1	
127	Aux Frame Channel - Expense per 10 foot channels		$18.00	$12.94	
128	Aux Frame Channel - Expense per 20 foot channel		$50.10	$38.05	
129	Aux Frame Channel - 45 Day Labor Expense per foot		$ 16.75	$ 16.75	
130	Aux Frame Channel - 90 Day Labor Expense per foot		$ 13.60	$ 13.60	
131	U Channel - Number of U Channels		1	0	U_Channel
132	U Channel - Expense per U Channel		$123.25	$0.00	
133	U Channel - 45 Day Labor Expense per foot		$ 23.25	$ 23.25	
134	U Channel - 90 Day Labor Expense per foot		$ 20.40	$ 20.40	
135	Number of Aux Frame Fittings		28.78947368	3.5625	Aerial_Other
136	Expense per Aux Frame Fitting		$20.27	$19.23	
137	Number of Aux Frames Support		68.47368421	18.4375	
138	Expense per Aux Frame Support		$7.00	$5.12	
139	Number of Aux Frame Nuts and Bolts		140.4736842	8.125	
140	Expense of Aux Frame Nuts and Bolts		$0.39	$0.29	
141	Number of Cable Racks Support		0.210526316	0	
142	Expense per Cable Rack Support		$24.19	$0.00	
143	Amount of Insulation		5.473684211	0.875	
144	Expense per Insulation		$2.63	$2.42	
145	Number of Miscellaneous Items		17.47368421	0.125	
146	Expense per miscellaneous item		$11.24	$6.58	
147	Number of Nuts and Bolts - cable racking		0.421052632	0.25	
148	Expense of Nuts and Bolts - cable racking		$0.52	$0.52	
149	Number of General Support items		1.578947368	0	
150	Expense of General Support items		$1.95	$0.00	
151	Number of U-Channel - Other Items		1.473684211	7.5	
152	Expense of U-Channel - Other Items		$7.25	$2.18	
153	Number of U-Channel Fittings		0	0.25	
154	Expense of U-Channel Fitting		$0.00	$2.78	
155					
156	**2 Cable Racking - Cageless**		Rack_Major	Rack_Minor	
157	Number of Channels		9.5	1.3	Cable_Tracking
158	Expense per Channel		$ 74.52	$ 69.17	

	A	B	C	D	E
159	45 Day Labor Expense per Channel	$	24.06	$ 24.06	
160	90 Day Labor Expense per Channel	$	21.93	$ 21.93	
161	Number of Ladders		1.5	0.1	
162	Expense per Ladder	$	30.70	$ 23.76	
163	45 Day Labor Expense per Ladder	$	24.06	$ 24.06	
164	90 Day Labor Expense per Ladder	$	21.93	$ 21.93	
165	Number of Horns		29.3	2.4	
166	Expense per Horn	$	13.93	$ 15.70	
167	45 Day Labor Expense per Horn	$	8.43	$ 8.43	
168	90 Day Labor Expense per Horn	$	7.00	$ 7.00	
169	Amount of Pan		7.2	1.4	
170	Expense for Pan	$	26.31	$ 28.77	
171	45 Day Labor Expense per Pan	$	16.14	$ 16.14	
172	90 Day Labor Expense per Pan	$	13.56	$ 13.56	
173	Number of Systems Ladders		10.6	1	
174	Expense per Systems Ladder	$	4.91	$ 2.65	
175	Number of Brackets		17.7	10.8	
176	Expense per Bracket	$	12.05	$ 13.60	
177	Number of Fittings		51.1	35	
178	Expense per Fitting	$	8.04	$ 6.84	
179	Number of Insulators		3.7	1.6	
180	Expense per Insulator	$	1.04	$ 0.64	
181	Number of Cable Racking Kits		9.1	3.8	
182	Expense per Cable Racking Kit	$	60.15	$ 49.39	
183	Number of Miscellaneous Items		142.7	40	
184	Expense per Miscellaneous Item	$	0.10	$ 0.02	
185	Number of Support Items		33.4	8.2	
186	Expense per Support Item	$	7.55	$ 6.14	
187	Number of Nuts and Bolts		16.8	20.1	
188	Expense per set of Nuts and Bolts	$	0.47	$ 0.49	
189					
190	**2 Bay Support - Cageless**		Bay		
191	Number of Bays		7.5	Bay_Array	
192	Expense per Bay	$	279.71		
193	45 Day Labor Expense per 1st Bay	$	497.82		
194	45 Day Labor Expense add'l Bay	$	393.61		
195	90 Day Labor Expense per Bay	$	438.27		
196	90 Day Labor Expense add'l Bay	$	332.62		
197	Number of AC Outlets		2.25		
198	Expense per AC Outlet	$	94.05		
199	45 Day Labor Expense per Outlet	$	126.93		
200	90 Day Labor Expense per Outlet	$	99.09		
201	Number of End Guards		3.5		
202	Expense per End Guard	$	379.46		
203	45 Day Labor Expense per End Guard	$	84.76		
204	90 Day Labor Expense per End Guard	$	58.14		
205	Number of Anchor Bolts		16.5		
206	Expense per Anchor Bolt Set	$	27.15		
207	Number of Filler Panels		2.875		
208	Expense per Filler Panel	$	220.09		
209	Number of Guard Rails		5		
210	Expense per Guard Rail	$	66.56		
211	Number of Mountings		28.25		
212	Expense per Mounting	$	89.70		
213	Number of Miscellaneous Items		12.75		
214	Expense per Miscellaneous Item	$	0.47		
215					
216	***2 Lighting***		Light_Cageless		
217	Number of Fixtures		2.56	Lighting	

I. Run Data

	A	B	C	D	E
218	Expense per Fixture		$ 111.70		

	A	B	C	D	E
219	45 Day Labor Expense per Fixture	$	213.59		
220	90 Day Labor Expense per Fixture	$	202.12		
221	Number of Lights		1.71		
222	Expense per Light	$	103.96		
223	45 Day Labor Expense per Light	$	213.59		
224	90 Day Labor Expense per Light	$	202.12		
225	Number of Cables		13.66		
226	Expense per Cable	$	0.37		
227	45 Day Labor Expense per 4 Cables	$	4.82		
228	90 Day Labor Expense per 4 Cables	$	3.31		
229	Number of Conduit Supports		0.07		
230	Expense per Conduit Support	$	165.46		
231	45 Day Labor Expense per foot Conduit Support	$	19.07		
232	90 Day Labor Expense per foot Conduit Support	$	17.77		
233	Number of Wires		17.07		
234	Expense per Wire	$	0.25		
235	45 Day Labor Expense per Wire	$	3.65		
236	90 Day Labor Expense per Wire	$	2.77		
237	Number of Conduit Supports - Other		12.00		
238	Expense per Conduit Support - Other	$	0.11		
239	Number of Outlet Raceways		2.27		
240	Expense per Outlet Raceway	$	44.11		
241	Number of Supports		8.15		
242	Expense per Support	$	8.42		
243	Number of Switches		1.20		
244	Expense per Switch	$	97.81		
245	Number of Fittings		8.73		
246	Expense per Fitting	$	4.74		
247	Number of Fitting Supports		0.73		
248	Expense per Fitting Supports	$	13.67		
249	Number of Miscellaneous Items		5.22		
250	Expense per Miscellaneous Item	$	0.27		
251					
252	**2.1 & 3.1 Cable Hole**	Cable_Hole			
253	Number of Fire Stop		0.83	Cable_Hole_Array	
254	Expense per Fire Stop	$	1.36		
255	45 Day Labor Expense per Fire Stop	$	271.74		
256	90 Day Labor Expense per Fire Stop	$	253.32		
257	Number of Bags		0.24		
258	Expense per Bag	$	29.34		
259	Number of Labels		1.27		
260	Expense per Label	$	0.22		
261	Amount of Putty		1.73		
262	Expense of Putty	$	27.02		
263	Number of Sheets		0.37		
264	Expense per Sheet	$	69.55		
265	Amount of Tape		0.07		
266	Expense of Tape	$	188.83		
267	Number of miscellaneous items		0.44		
268	Expense per miscellaneous item	$	2.64		
269					
270	**2.1 Cageless Miscellaneous Inputs**	Misc_Inputs			
271	Number of Ducts		0.20	Misc_Inputs_Array	
272	Expense per Duct	$	3.06		
273	45 Day Labor Expense per Duct	$	22.45		
274	90 Day Labor Expense per Duct	$	18.89		
275	Number of Misc Materials		0.95		
276	Expense for Misc Materials		803.1787179		
277	Number of Bolt Kits		0.02		

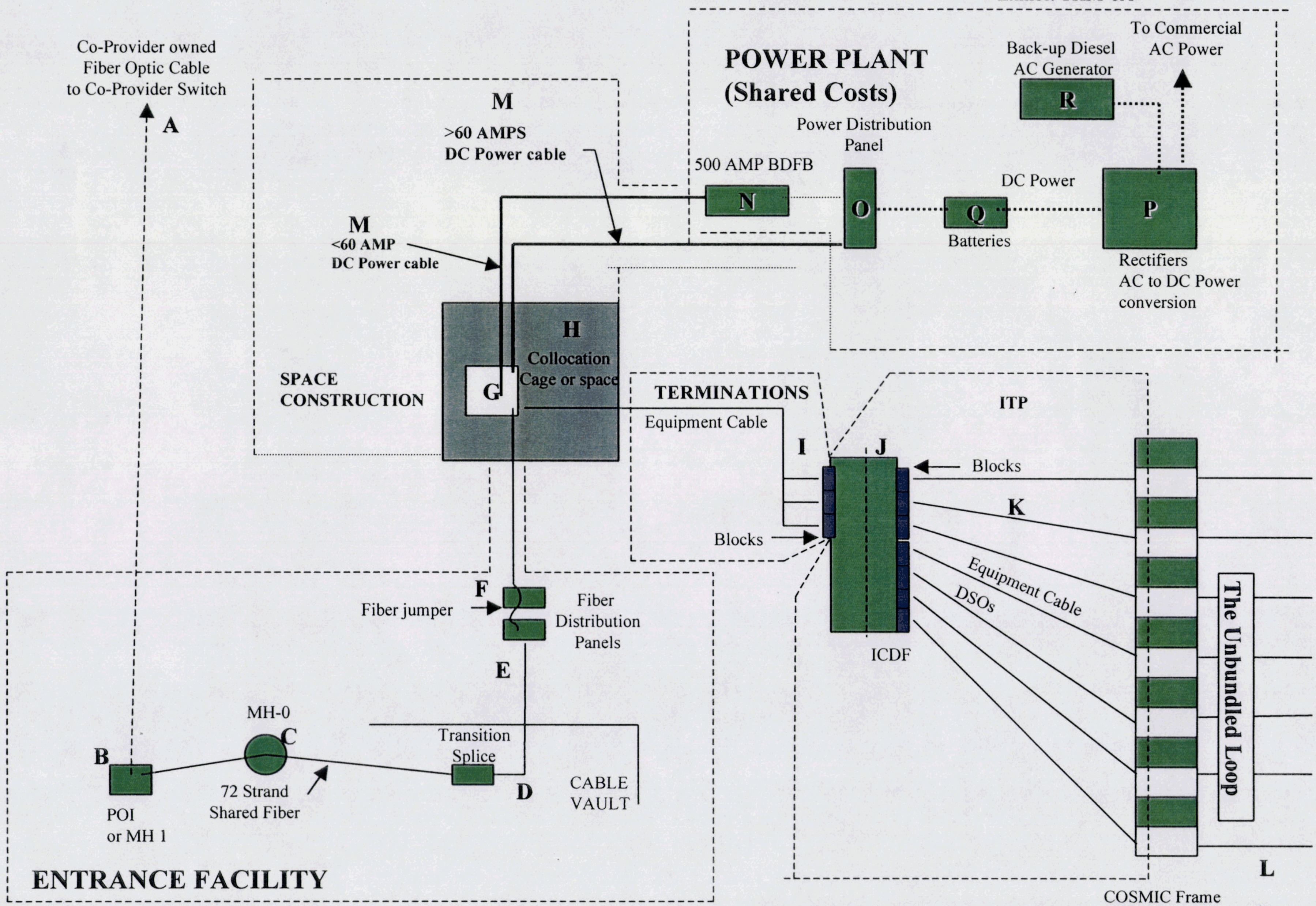
	A	B	C	D	E
278	Expense per Bolt Kit	$	7.53		
279	Number of Eqpt Nuts and Bolts		0.17		
280	Expense for Eqpt Nuts and Bolts	$	5.71		
281	Number of General Nuts and Bolts		17.12		
282	Expense for General Nuts and Bolts	$	0.40		
283	Amount of Paint		1.29		
284	Expense for Paint	$	8.66		
285	Number of Tags		2.02		
286	Expense per Tag	$	2.86		
287	Amount of Tape		0.34		
288	Expense for Tape	$	9.92		
289	Number of Miscellaneous Items		5.49		
290	Expense per Miscellaneous Item	$	115.25		
291					
292	**2 Grounding - Cageless**	Grounding_Cageless			
293	1/0 Cable Footage		0.975609756	Grounding_Cageless_Array	
294	Expense per foot of 1/0 Cable	$	3.12		
295	45 Day Labor Expense per foot of 1/0 Cable	$	3.42		
296	90 Day Labor Expense per foot of 1/0 Cable	$	2.42		
297	#2 Cable Footage		34.87804878		
298	Expense per foot of #2 Cable	$	1.56		
299	45 Day Labor Expense per foot of #2 Cable	$	1.21		
300	90 Day Labor Expense per foot of #2 Cable	$	0.83		
301	4/0 Cable Footage		33.65853659		
302	Expense per foot of 4/0 Cable	$	2.11		
303	45 Day Labor Expense per foot of 4/0 Cable	$	6.35		
304	90 Day Labor Expense per foot of 4/0 Cable	$	4.54		
305	#6 Cable Footage		0.609756098		
306	Expense per foot of #6 Cable	$	0.67		
307	45 Day Labor Expense per foot of #6 Cable	$	1.21		
308	90 Day Labor Expense per foot of #6 Cable	$	0.83		
309	750 Cable Footage		10.85365854		
310	Expense per foot of 750 Cable	$	8.80		
311	45 Day Labor Expense per foot of 750 Cable	$	27.42		
312	90 Day Labor Expense per foot of 750 Cable	$	18.90		
313	Number of Ground Bars		0.07		
314	Expense per Ground Bar	$	83.28		
315	45 Day Labor Expense per Ground Bar	$	299.52		
316	90 Day Labor Expense per Ground Bar	$	247.95		
317	Amount of Alternative Racking		1.073170732		
318	Expense of Alternative Racking	$	6.87		
319					
320	**3 Cable Racking - Caged**	Rack_Major_Caged		Rack_Minor_Caged	
321	Number of Channels		8	2.5	Rack_Caged_Array
322	Expense per Channel	$	74.52	$ 69.17	
323	45 Day Labor Expense per Channel	$	24.06	$ 24.06	
324	90 Day Labor Expense per Channel	$	21.93	$ 21.93	
325	Number of Horns		24.6	4.6	
326	Expense per Horn	$	13.93	$ 15.70	
327	45 Day Labor Expense per Horn	$	8.43	$ 8.43	
328	90 Day Labor Expense per Horn	$	7.00	$ 7.00	
329	Amount of Pan		6.0	2.7	
330	Expense for Pan	$	26.31	$ 28.77	
331	45 Day Labor Expense per Pan	$	16.14	$ 16.14	
332	90 Day Labor Expense per Pan	$	13.56	$ 13.56	
333	Number of Systems Ladders		8.9	1.2	
334	Expense per Systems Ladder	$	4.91	$ 2.65	
335	Number of Brackets		14.9	20.8	
336	Expense per Bracket	$	12.05	$ 13.60	

	A	B	C	D	E
337	Number of Fittings		43.0	67.3	
338	Expense per Fitting	$	8.04	$ 6.84	
339	Number of Insulators		3.1	3.1	
340	Expense per Insulator	$	1.04	$ 0.64	
341	Number of Cable Racking Kits		7.7	7.3	
342	Expense per Cable Racking Kit	$	60.15	$ 49.39	
343	Number of Miscellaneous Items		120.2	76.9	
344	Expense per Miscellaneous Item	$	0.10	$ 0.02	
345	Number of Support Items		28.1	15.8	
346	Expense per Support Item	$	7.55	$ 6.14	
347	Number of Nuts and Bolts		14.2	38.7	
348	Expense per set of Nuts and Bolts	$	0.47	$ 0.49	
349					
350	**3 Overall Aerial Support - Caged**	Aerial_Caged_Major		Aerial_Caged_Minor	
351	Aux Frame Channel - Number of 10 foot channels		32	5	Aerial_Caged_Array
352	Aux Frame Channel - Number of 20 foot channels		16	3	
353	Aux Frame Channel - Expense per 10 foot channels	$	18.00	$ 12.94	
354	Aux Frame Channel - Expense per 20 foot channel	$	50.10	$ 38.05	
355	Aux Frame Channel - 45 Day Labor Expense per foot	$	16.75	$ 16.75	
356	Aux Frame Channel - 90 Day Labor Expense per foot	$	13.60	$ 13.60	
357	U Channel - Number of U Channels		1	0	
358	U Channel - Expense per U Channel		$123.25	$0.00	
359	U Channel - 45 Day Labor Expense per foot	$	23.25	$ 23.25	
360	U Channel - 90 Day Labor Expense per foot	$	20.40	$ 20.40	
361	Number of Aux Frame Fittings		20.64	3.59	
362	Expense per Aux Frame Fitting		$20.27	$19.23	
363	Number of Aux Frames Support		49.09	18.59	
364	Expense per Aux Frame Support	$	7.00	$ 5.12	
365	Number of Aux Frame Nuts and Bolts		100.72	8.19	
366	Expense of Aux Frame Nuts and Bolts	$	0.39	$ 0.29	
367	Number of Cable Racks Support		0.15	0.00	
368	Expense per Cable Rack Support	$	24.19	$ -	
369	Amount of Insulation		3.92	0.88	
370	Expense per Insulation	$	2.63	$ 2.42	
371	Number of Miscellaneous Items		12.53	0.13	
372	Expense per miscellaneous item	$	11.24	$ 6.58	
373	Number of Nuts and Bolts - cable racking		0.30	0.25	
374	Expense of Nuts and Bolts - cable racking	$	0.52	$ 0.52	
375	Number of General Support items		1.13	0.00	
376	Expense of General Support items		$1.95	$0.00	
377	Number of U-Channel - Other Items		1.06	7.56	
378	Expense of U-Channel - Other Items	$	7.25	$ 2.18	
379	Number of U-Channel Fittings		0.00	0.25	
380	Expense of U-Channel Fitting		$0.00	$2.78	
381					
382	**3.1 Caged Expense Inputs**	Caged_Inputs			
383	Fence - 100 sf		$3,970.00	Caged_Inputs_Array	
384	Fence - 200 sf		$4,950.00		
385	Fence - 300 sf		$5,560.00		
386	Fence - 400 sf		$6,140.00		
387	HVAC - 100 sf		$713.00		
388	HVAC - 200 sf		$854.00		
389	HVAC - 300 sf		$1,071.00		
390	HVAC - 400 sf		$1,596.00		
391	Electrical Distrtribution - 100 sf		$4,341.00		
392	Electrical Distrtribution - 200 sf		$4,379.00		
393	Electrical Distrtribution - 300 sf		$4,398.00		
394	Electrical Distrtribution - 400 sf		$4,416.00		
395	*Lighting - 100 sf*		$679.00		

	A	B	C	D	E
396	Lighting - 200 sf		$932.00		
397	Lighting - 300 sf		$1,184.00		
398	Lighting - 400 sf		$1,437.00		

Arizona Corporation Commission
Docket No. T-00000A-00-0194Phase II
Direct Testimony of Teresa K. Million
Exhibit TKM-6A

COLLOCATION CONFIGURATION



- **ENTRANCE FACILITY**
- "A" - Co-Provider Fiber.
- "B" - POI utility hole or Manhole 1
- "C" - MH-0 - The first utility hole outside the central office. A shared 72 strand fiber cable is placed between the POI and VAULT passing through this utility hole. The 72 strand is broken out into 6 - 12 strand compliments
- "D" - Transition point - The black sheath cable must be spliced within 50 ft of the entrance to fire rated cable prior to entering the central office environment.
- "E & F" - Fiber Distribution Panel is the point in the office where the Qwest shared fiber connects to the fiber that extends into the Co-Provider's collocation space.
- **SPACE CONSTRUCTION**
- "G" - The Co-Provider's telecommunications equipment
- "H" - The Co-Provider's collocation caged structure or cageless space
- "M"- Power Cables
- **TERMINATIONS**
- "I" - The equipment cables and terminating blocks. CLECs have test access at this point
- **ITP**
- "J" - The IDF, COSMIC and DSX frames ,cables and terminating blocks and cable racking. Qwest test point for trouble isolation on a UNE
- "K" - Tie cable connecting the ICDF to the COSMIC.
- "L" - USW COSMIC frame.
- **POWER PLANT**
- "N" - Battery distribution fuse board (BDFB) - Power leads of amperage < 60 AMPS used to power equipment bays.
- "O" - Power Distribution Board - Power leads > 60 AMPS used to power equipment bays and feed for the BDFBs
- "P" - Rectifiers -AC TO DC power conversion
- "Q" - Batteries used for dc backup power
- "R" - Diesel AC generator - Used to back-up the batteries if the commercial power should fail

POWER PLANT

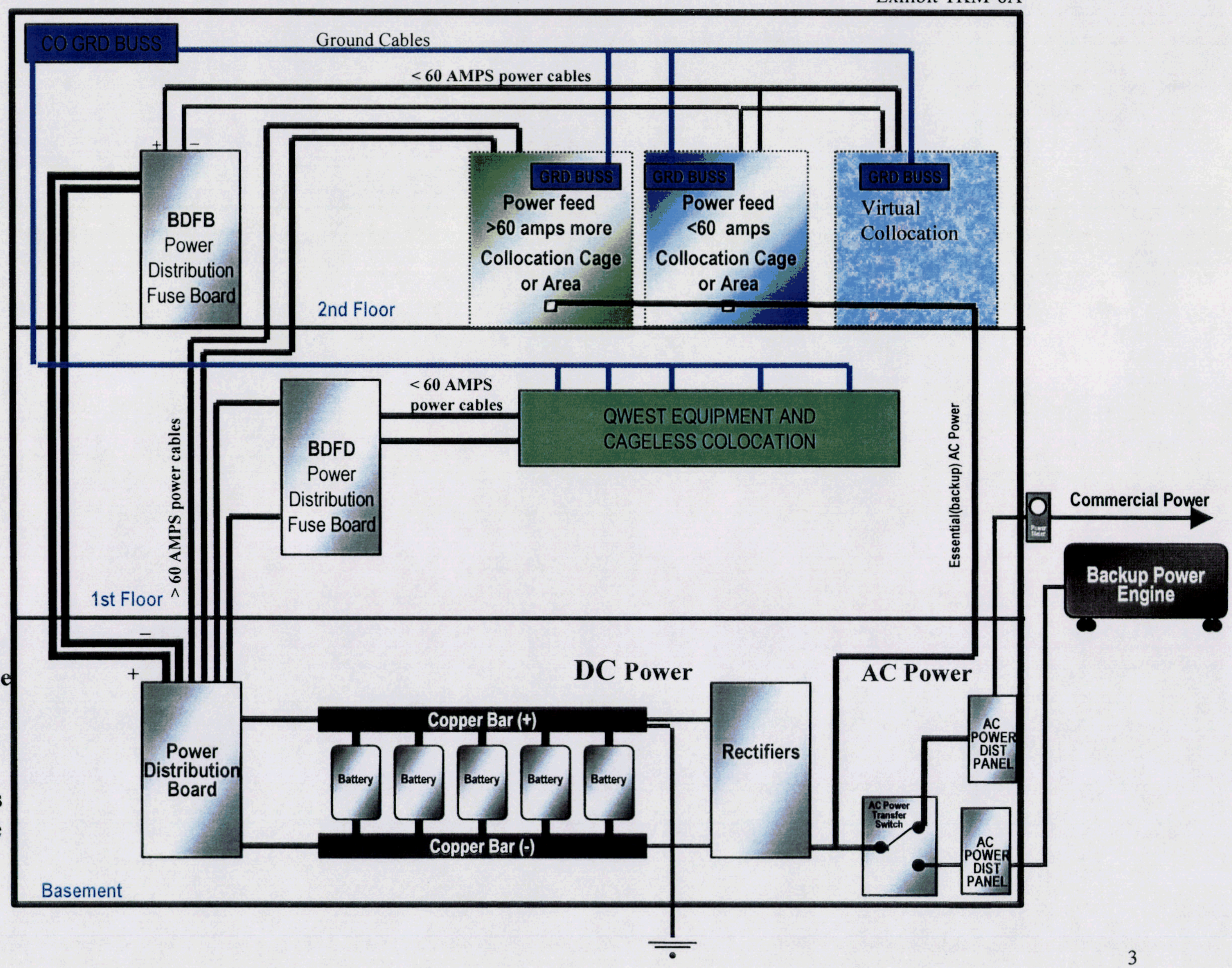
Power Plant

Recurring
AC generator
BDFB
PDB
Batteries
Power usage
Rectifiers
Ground Buss
AC Power Usage

Non-recurring

DC Power Cable
Grounding Cable
AC Essential Pwr Cable

Note
AC convenience outlets included in Cage Space



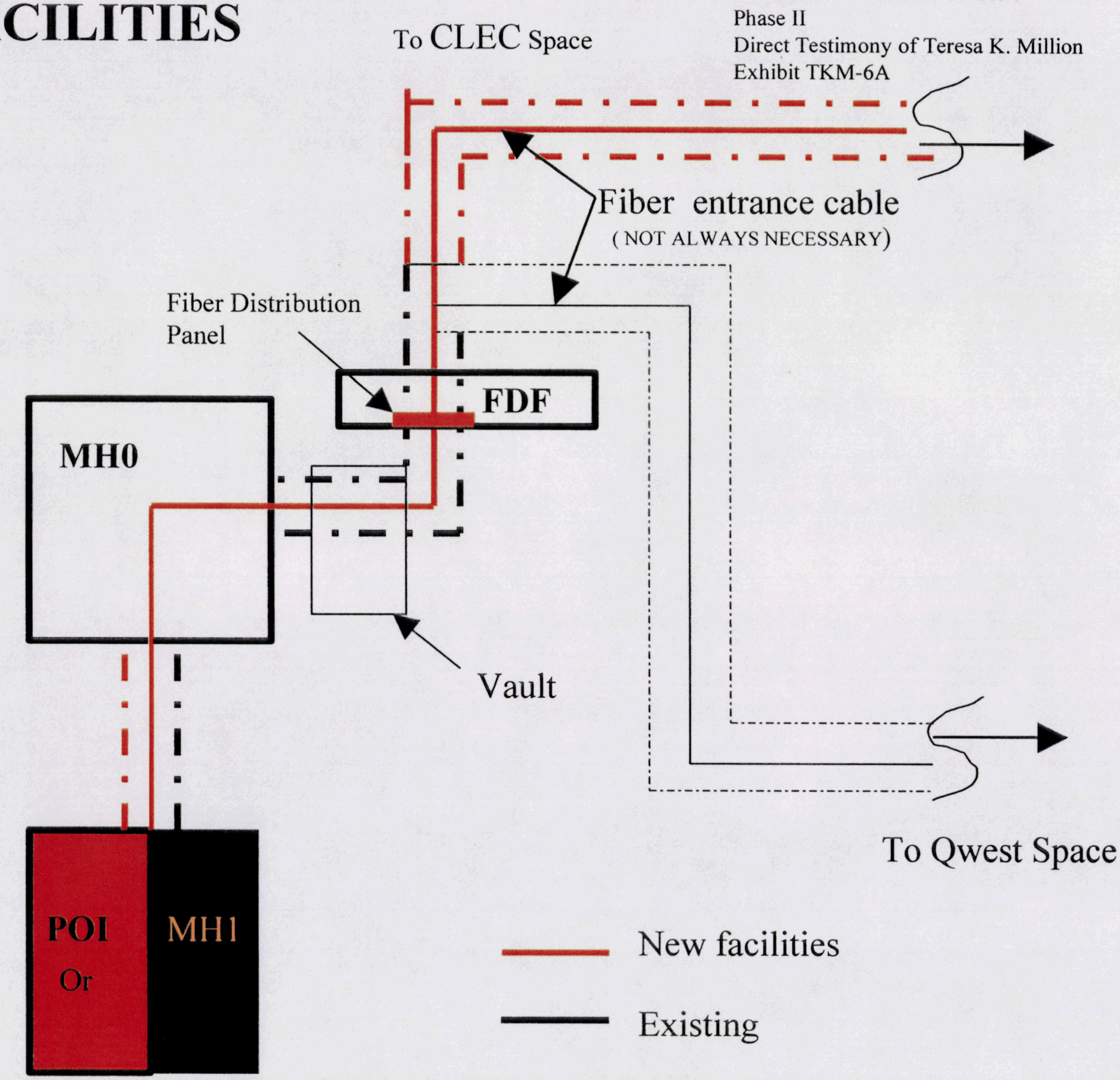
ENTRANCE FACILITIES

Non Recurring

Utility Hole (New)
Fiber splicing and testing
Single fiber jumper
Cable Racking (New)
Cable Placement
Cable (Fiber)
Fiber Placement
Conduit / Innerduct /
Riser (New)
Fiber Distribution Panel

Recurring

Utility Hole (Existing)
Conduit / Innerduct /
Riser (Existing)
Fiber Distribution Frame
Cable Rack (Existing)
Maintenance



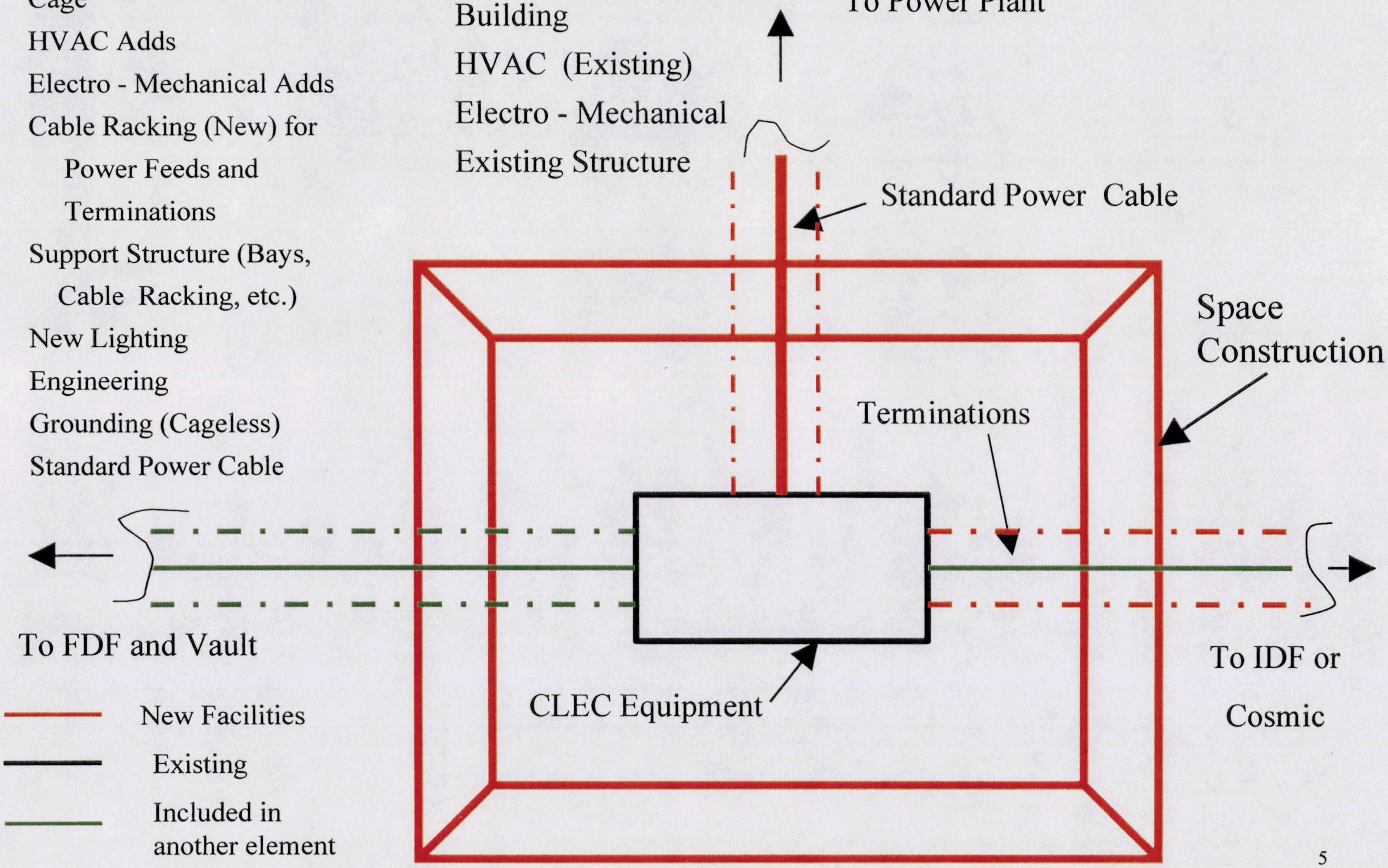
Space Construction

Non Recurring

- Cage
- HVAC Adds
- Electro - Mechanical Adds
- Cable Racking (New) for Power Feeds and Terminations
- Support Structure (Bays, Cable Racking, etc.)
- New Lighting
- Engineering
- Grounding (Cageless)
- Standard Power Cable

Recurring

- Building
- HVAC (Existing)
- Electro - Mechanical
- Existing Structure



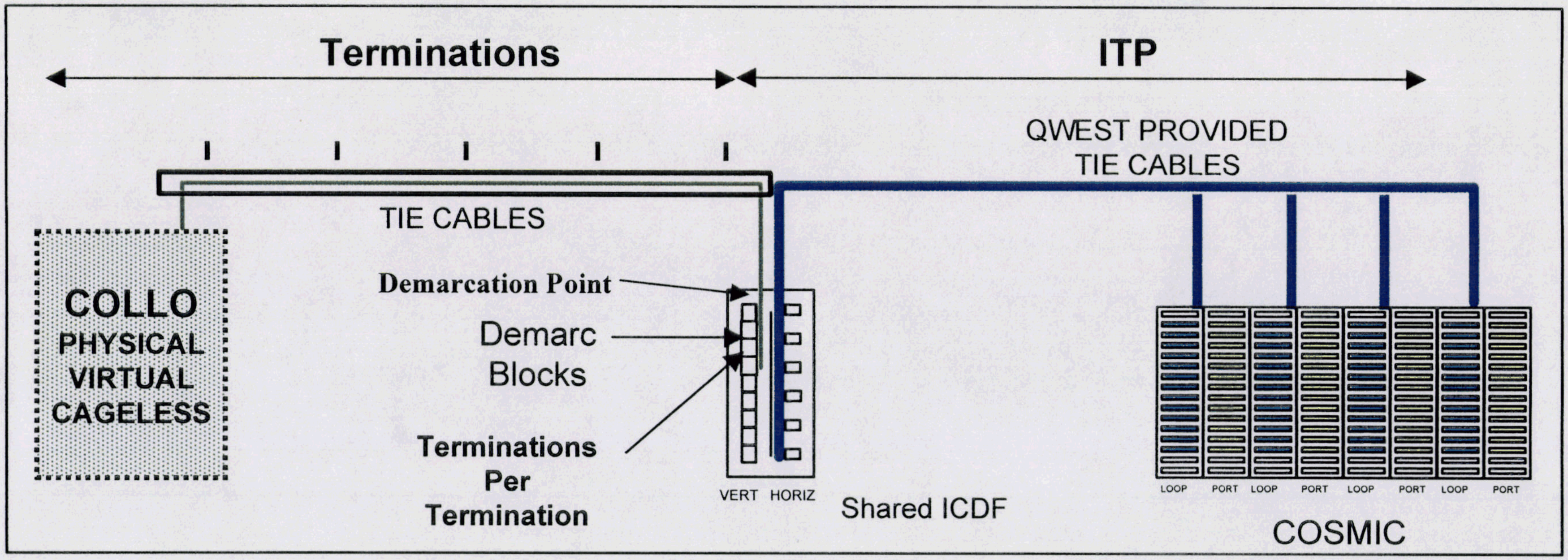
TERMINATIONS

Non-recurring
Blocks/Panel
Cable

ITP (Interconnection Tie Pair)

Recurring
Intermediate Frame
COSMIC Frame (DS0)
DSX Frame (DS1, DS3)
Blocks
Cable
Cable Racking
Meld Run

DSO Example



REDACTED

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-09
March 15, 2001

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-10
March 15, 2001

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-11
March 15, 2001

REDACTED

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-13
March 15, 2001

REDACTED

Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-14
March 15, 2001

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Arizona Corporation Commission
Docket No. T-00000A-00-0194
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Direct Testimony of T. K. (Terri) Million
Exhibit TKM-17
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Arizona Corporation Commission
Docket No. T-00000A-00-0194
Qwest Corporation
Direct Testimony of T. K. (Terri) Million
Exhibit TKM-18
March 15, 2001

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BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION	)	
INTO QWEST CORPORATION'S	)	
COMPLIANCE WITH CERTAIN	)	DOCKET NO. T-00000A-00-0194
WHOLESALE PRICING REQUIREMENTS	)	
FOR UNBUNDLED NETWORK ELEMENTS	)	PHASE II
AND RESALE DISCOUNTS	)	

DIRECT TESTIMONY OF

WILLIAM E. TAYLOR, Ph.D.

SENIOR VICE PRESIDENT
NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC.

ON BEHALF OF

QWEST CORPORATION

March 15, 2001

n/e/r/a
Consulting Economists

DIRECT TESTIMONY OF WILLIAM E. TAYLOR, Ph.D.

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is William E. Taylor. I am Senior Vice President of National Economic Research Associates, Inc. ("NERA"), head of its Communications Practice, and head of its Cambridge office located at One Main Street, Cambridge, Massachusetts 02142.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS EXPERIENCE.

A. I have been an economist for over twenty-five years. I earned a Bachelor of Arts degree from Harvard College in 1968, a Master of Arts degree in Statistics from the University of California at Berkeley in 1970, and a Ph.D. from Berkeley in 1974, specializing in Industrial Organization and Econometrics. For the past twenty-five years, I have taught and published research in the areas of microeconomics, theoretical and applied econometrics, which is the study of statistical methods applied to economic data, and telecommunications policy at academic and research institutions. Specifically, I have taught at the Economics Departments of Cornell University, the Catholic University of Louvain in Belgium, and the Massachusetts Institute of Technology. I have also conducted research at Bell Laboratories and Bell Communications Research, Inc.

I have participated in telecommunications regulatory proceedings before several state public service commissions including the Arizona Corporation

Commission ("Commission"). In addition, I have filed testimony before the Federal Communications Commission ("FCC") and the Canadian Radio-television Telecommunications Commission on matters concerning incentive regulation, price cap regulation, productivity, access charges, local competition, interLATA competition, interconnection and pricing for economic efficiency. Recently, I was chosen by the Mexican Federal Telecommunications Commission and Telefonos de Mexico ("Telmex") to arbitrate the renewal of the Telmex price cap plan in Mexico.

I have also testified on market power and antitrust issues in federal court. In recent work years, I have studied—and testified on—the competitive effects of mergers among major telecommunications firms and of vertical integration and interconnection of telecommunications networks.

Finally, I have appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer. My curriculum vita is attached as Exhibit WET-1.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been asked by Qwest Corporation ("Qwest") to provide an economist's perspective on the issue of inter-carrier compensation for Internet-bound traffic.

III. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR POSITION ON INTER-CARRIER COMPENSATION FOR INTERNET-BOUND TRAFFIC.

A. My position on that issue is summarized as follows:

1. Regardless of whether Internet-bound calls are *jurisdictionally* local or interstate, the correct economic perspective on inter-carrier compensation is based on the principle of cost causation. According to that principle, reciprocal compensation should not be paid by the originating incumbent local exchange carrier ("ILEC") for Internet-bound calls. Instead, the Internet service provider ("ISP") should compensate that carrier (and any other carrier that switches the Internet-bound call) for the end-to-end cost caused by the ISP customer, and recover that cost directly from the ISP customer.
2. The economic role of the ISP is not that of an end-user (of a serving competitive local exchange carrier or "CLEC") but rather that of a carrier. Therefore, like the IXC that pays carrier access charges to partially defray the cost of a long distance call, the ISP should ideally pay analogous access-like usage-based charges to defray costs incurred by other carriers on its behalf to switch an Internet-bound call. That form of inter-carrier compensation would be economically efficient.
3. Internet-bound calls may resemble local voice calls in some respects but that resemblance can be deceptive for purposes of determining the appropriate form of inter-carrier compensation. There are substantive differences between how costs arise for the two types of traffic. The cost causation principle should determine how cost should be recovered for Internet-bound traffic, i.e., who should pay and who should receive compensation.
4. Reciprocal compensation payments (from the ISP customer's originating ILEC to the CLEC that ultimately switches the call to the ISP) are likely to generate an inefficient subsidy for Internet use, distort the local exchange market, and generate unintended arbitrage opportunities for CLECs. Such compensation creates opportunities for CLECs to specialize in serving ISPs with the sole aim of accumulating reciprocal compensation revenues.
5. Besides Arizona, six other states (Massachusetts, New Jersey, South Carolina, Louisiana, Colorado, and Iowa) have thus far determined that the payment of reciprocal compensation by ILECs originating Internet-bound calls be stopped. Massachusetts and Louisiana regulators, in particular, noted that by encouraging arbitrage opportunities, the reciprocal compensation regime of inter-carrier compensation for Internet-bound calls subverts real local exchange competition. In addition to recognizing these ill effects, the Colorado

Commission applied the economic analysis outlined in this testimony and concluded that reciprocal compensation should not be paid for Internet-bound traffic. Like Colorado and Arizona, Iowa has instituted bill-and-keep instead.

6. The preferred form of inter-carrier compensation for Internet-bound traffic is the payment of access-like usage-based charges by the ISP to the ILEC and the CLEC. Because the FCC currently exempts ISPs from paying access charges, the next-best cost-causative form of compensation would be an equitable sharing (between the ILEC and the CLEC) of revenues earned by the CLEC from the lines that it sells to the ISP. This form of revenue sharing may not be sufficient for the ILEC and CLEC that jointly provide access service to fully recover their costs, but the degree to which they under-recover those costs (or, equivalently, subsidize Internet service) would be in the same proportion as their respective costs and, hence, competitively neutral. Bill-and-keep, or reciprocal compensation at a zero rate, is not a cost-causative form of compensation, but neither is it as distortive as reciprocal compensation at a positive rate. Bill-and-keep can be a third-best and reasonable interim form of compensation for Internet-bound traffic. Because it is not based on cost causation, reciprocal compensation at a positive rate should not be an option at all.

IV. Inter-Carrier Compensation for Internet-Bound Calls

A. Economic Principles for Determining Inter-Carrier Compensation for Internet-Bound Traffic

Q. WHAT IS THE PROPER BASIS FOR SELECTING THE FORM OF INTER-CARRIER COMPENSATION THAT IS APPROPRIATE FOR INTERNET-BOUND TRAFFIC?

A. Regardless of the precise jurisdictional status of Internet-bound calls (i.e., whether they are interstate, local, or something else), the proper application of economic principles holds the key to determining what form of compensation is appropriate for Internet-bound calls, and who should compensate whom.

Q. PLEASE EXPLAIN THE PRINCIPLE OF COST CAUSATION AND ITS RELEVANCE TO COST RECOVERY.

A. The fundamental economic principle underlying all pricing and cost recovery mechanisms should be cost causation. The principle asks two questions: (1) who or what has caused the cost in question (cost source)? and (2) how much is the cost in question (requisite level of cost recovery)? According to this principle, having identified the source of the cost, it is economically efficient to recover the entire cost directly from that source. This linkage between cost recovery and the cost source stands on its own, and makes no reference whatsoever to the distribution of benefits. That is, even if an activity provides benefits to others besides the cost-causer, it is efficient to recover that cost fully from its source and not from incidental beneficiaries.

Consumers determine what and how much to buy on the basis of prices they pay. Their act of buying also causes cost. To ensure that society's scarce resources are put to their best use, and that only the goods and services of highest value to society are produced and consumed, consumers (cost-causers) must be made to pay prices that fully reflect the costs they cause. Application of the cost causation principle thus leads to prices that fully recover costs and, at the same time, ensure that consumption occurs—and resources are used—efficiently.

Q. WHAT DOES THE COST CAUSATION PRINCIPLE IMPLY ABOUT THE NATURE OF THE RELATIONSHIP BETWEEN THE END-USER THAT MAKES

AN INTERNET-BOUND CALL AND THE ISP THAT PROVIDES INTERNET ACCESS FOR THAT CALL?

A. Cost causation implies that the relationship between the end-user (making an Internet-bound call) and the ISP is analogous to that between the end-user (making a long distance call) and an IXC. In fact, regardless of the exact jurisdictional status of Internet calls, there are sound *economic* reasons to require that the ISP pay charges to the ILEC and/or CLEC that are similar to the access charges paid by IXCs to the ILEC for all long distance calls carried.

Q. PLEASE EXPLAIN WHY COST CAUSATION IMPLIES THAT ANALOGY.

A. Suppose I am a Qwest subscriber for local service and an Earthlink customer for Internet traffic. Suppose further that Earthlink obtains access service (i.e., receives Internet-bound traffic) from a CLEC, say Sprint. When I place an Internet-bound call through my computer, what costs are incurred and what revenue sources are available to cover those costs? Switching and transmission costs are straightforward: Qwest carries the call from my computer to its point of connection ("POC") with Sprint,[1] Sprint carries the call to Earthlink, and Earthlink performs protocol conversion and sends the call out into the Internet. Revenue to cover these costs comes from three sources: I pay a regulated price for residential local exchange service to Qwest, and a competitively-determined price for ISP services

[1] A POC is a point at which the carrier serving the ISP (which may be a CLEC) delivers an Internet-bound call to the ISP.

to Earthlink. Earthlink pays Sprint a price for network access service[2] (but is exempted by the FCC from having to pay access charges, a matter I discuss below).

Two economic propositions are important in determining who should pay what to whom in this circumstance:

1. When I dial the access number for Earthlink, I am acting as a customer of Earthlink to which I pay a monthly access fee, even though the call is facilitated by the originating ILEC (Qwest) and the co-carrier CLEC (Sprint) serving the ISP.
2. Earthlink performs the economic functions of a carrier—or an ESP—that routes the Internet call through the backbone network to its final destination. Earthlink performs standard carrier functions such as transport and routing, as well as maintains leased facilities within the backbone network.

Under these assumptions, an Internet-bound call is identical in function to an interstate long distance call where the IXC collects the revenue from the cost-causing end-user and pays all the other carriers necessary to complete the call.

The principle of cost causation implies that, *for the purposes of an Internet call*, I am properly viewed as an Earthlink customer placing an Internet-bound call, not a Qwest customer placing a local call. Qwest and Sprint simply provide access-like functions to help the Internet call on its way, just as they might provide originating or terminating carrier access to help an IXC carry an interstate long distance call. Therefore, because the economic relationship is analogous to ILEC-IXC interconnection (access), rather than to ILEC-CLEC interconnection (local), the efficient form of inter-carrier compensation is for the ISP to compensate its serving

[2] In view of Sprint's acquisition of Earthlink, I assume the payment here is of an internal transfer price.

LEC, which, in turn, shares that compensation with any co-carriers that have incurred costs in handling the call.

B. Comparison of Alternative Inter-Carrier Compensation Mechanisms

Q. WHAT IS THE ECONOMICALLY EFFICIENT FORM OF INTER-CARRIER COMPENSATION FOR INTERNET-BOUND CALLS IMPLIED BY THE COST CAUSATION PRINCIPLE?

A. When end-users place Internet-bound calls from within a LEC's network but must purchase an ISP's service to gain access to the Internet, the economically efficient form of inter-carrier compensation implied by cost causation takes the form of access-like usage-based charges paid by the ISP to the ILEC (which originates the Internet-bound call) and the CLEC (that delivers that call to the ISP). The ISP can then recover those payments through the fee for Internet access it charges the end-user.

Q. DO ISPs PAY CHARGES ANALOGOUS TO CARRIER ACCESS TODAY?

A. No. The FCC has only taken the first step towards establishing the jurisdictional status of Internet-bound traffic and the form of inter-carrier compensation that should apply to it.[3] However, no rulemaking has yet occurred at the FCC to

[3] FCC, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Inter-Carrier Compensation for Internet-bound Traffic*, CC Docket Nos. 96-98 and 99-68, Declaratory Ruling in CC Docket No. 96-98 and Notice of Proposed Rulemaking in CC Docket No. 99-68 ("*Internet Traffic Order*"), released February 26, 1999.

establish such charges for ISPs, and the D.C. Circuit Court of Appeal's recent decision calls into question when such rulemaking will occur.[4] In the meantime, ISPs remain beneficiaries of an exemption from paying interstate carrier access charges that has been granted to ESPs since 1983.

Q. WHAT RATIONALE HAS THE FCC USED TO JUSTIFY THE ESP EXEMPTION?

A. The FCC has generally argued that the ESP exemption was necessary to protect fledgling information service providers from the effects of per-minute charges: i.e.,

> to protect certain users of access services, such as ESPs, that had been paying the generally much lower business service rates from the rate shock that would result from immediate imposition of carrier access charges.[5]

Whether 15 years is adequate to dissipate potential rate shock is an interesting economic question but one that is beside the point, as the FCC and Congress have made it abundantly clear that no per-minute charge will be assessed on ISPs.

Q. GIVEN THAT ACCESS-LIKE CHARGES ARE RULED OUT AS A PRACTICAL MATTER, WHAT FORM HAS INTER-CARRIER COMPENSATION FOR INTERNET-BOUND CALLS TRADITIONALLY TAKEN?

[4] The United States Court of Appeals for the District of Columbia vacated the *Internet Traffic Order* in a decision issued March 24, 2000. (Bell Atlantic v. FCC, No. 99-1094, D.C. Cir., March 24, 2000). In doing so, the court remanded the case back to the FCC for further explanation of its conclusion that Internet-bound traffic is predominately interstate. In response to the court's decision, the FCC's Common Carrier Bureau Chief observed that the ruling does not alter his view that ISP traffic is interstate but, instead, requires the FCC to provide further explanation of that conclusion. (*TR Daily*, March 24, 2000)

[5] *Internet Traffic Order*, ¶5, and FCC, *In Re: MTS and WATS Market Structure*, CC Docket No. 78-72, Memorandum Opinion and Order ("*MTS/WATS Order*"), 1983, at ¶715.

A. There is a history of states adopting reciprocal compensation, which first arose in the context of the exchange of local voice traffic, for the exchange of Internet-bound traffic as well. In recent years, however, at least six states—including Arizona—have declared their opposition to reciprocal compensation for Internet-bound traffic. With federal policy on this issue now in limbo because of the remand back to the FCC, states have to increasingly rely on their own resources and understanding of the issues to determine inter-carrier compensation policy. This proceeding represents an opportunity for the Commission to revisit that policy, particularly in light of its recent decision to adopt bill-and-keep, rather than reciprocal compensation, for Internet-bound traffic.[6] Besides Arizona, Colorado has also recently adopted bill-and-keep as the preferred policy, given that compensation may not take the form of access charges.[7]

Q. DOES COST CAUSATION SUPPORT RECIPROCAL COMPENSATION FOR INTERNET-BOUND CALLS?

[6] Arizona Corporation Commission, *In the Matter of the Petition of Sprint Communications Company, L.P. for Arbitration of Interconnection Terms, Conditions and Related Arrangements with U S WEST Communications, Inc.*, Docket Nos. T-02432B-00-0026 and T-01051B-00-0026, Decision No. 62650, adopted June 13, 2000.

[7] Colorado Public Utilities Commission, *In the Matter of the Petition of Sprint Communications Company, L.P. for Arbitration Pursuant to U.S. Code § 252(B) of the Telecommunications Act of 1996 to Establish an Interconnection Agreement with U S WEST Communications, Inc.*, Docket No. 00B-011T, Initial Commission Decision ("*Colorado ISP Order*"), adopted May 3, 2000. Also see Colorado Public Utilities Commission, Decision Denying Application for Rehearing, Reargument, or Reconsideration, Docket No. 00B-011T, adopted June 7, 2000.

A. No, inter-carrier compensation in the form of reciprocal compensation is not economically efficient for Internet-bound calls. Reciprocal compensation is economically justified only for local *voice* traffic, where:

1. the ILEC subscriber acts as a customer of the local originating ILEC,[8] purchasing local exchange service out of the ILEC's tariff, and
2. the call terminates at a local exchange end-user, i.e., a party that does not receive revenue from the originating end-user for carrying the call.

In the example above, when I place my Internet-bound call, I am acting as a customer of Earthlink. Although the portion of my Internet call that lies entirely within the circuit-switched network, i.e., up to the ISP, *resembles* a local voice call, its economic function is very different, since the ISP is not simply a passive end-user recipient of my call.[9] Rather, Earthlink has designed, marketed and sold me the service I am using, collected my monthly fee for Internet access, answered my questions, established telephone numbers at which I can access its services without paying toll charges and paid Sprint for access to the public switched

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[8] I distinguish here between a "subscriber" and a "customer" in order to show cost causation. I subscribe to my local carrier in order to have *access* to the public switched network, but I act as a customer of that local carrier in order to *use* Call Waiting service or of a long distance carrier in order to *use* interstate long distance service. When I am a customer of the local carrier, I cause usage-sensitive costs for that carrier. Similarly, I cause costs for the long distance carrier when I use *its* long distance service.

[9] This point has been made very clearly by the Louisiana Public Service Commission. In becoming the fourth state regulatory agency to deny the payment of reciprocal compensation for Internet-bound traffic, the Louisiana Commission stated:

> There is no prevailing industry custom of treating ISP traffic as "local" for reciprocal compensation purposes. FCC regulations require that ISPs be treated as end users *for only one purpose, the access charge exemption.*

Louisiana Public Service Commission, *In re Petition of KMC Telecom, Inc. Against BST to Enforce Reciprocal Compensation Provisions of the Parties' Interconnection Agreement*, Order in Docket No. U23839 ("*Louisiana ISP Compensation Order*"), October 13, 1999, at 13.

telephone network. Thus, the same subscriber that acts in the capacity of a customer of the originating ILEC when making a local voice call, acts in the capacity of a customer of the ISP when making an Internet-bound call. This situation is not an unfamiliar one: it is exactly analogous to the subscriber acting in the capacity of a customer of an IXC when making a long distance call.

Q. PLEASE EXPLAIN THE CONTRAST BETWEEN THESE TWO "MODELS" OF INTER-CARRIER COMPENSATION IN MORE DETAIL.

A. ***ILEC-CLEC Interconnection Model.*** When a Qwest subscriber places a local voice call that terminates to a CLEC subscriber, what functions does Qwest perform? Obviously, it originates the call by providing dialtone, local switching, and transport to the CLEC's point of interconnection. In addition, Qwest has marketed the service to its subscriber (and customer of local calls) and, under regulatory direction, determined both price level and structure and other terms and conditions under which the customer makes the call. Qwest will determine if the call has been completed, bill and collect from the customer for the call (if measured service applies) or for flat-rate service, and answer questions regarding the bill or the service. The story is precisely symmetric if the originating party is a CLEC customer and Qwest or another CLEC terminates the call.

Thus, under ILEC-CLEC interconnection, the originating subscriber is the cost-causer and a customer of the originating ILEC. That originating ILEC charges its cost-causing customer for the entire end-to-end call and compensates the CLEC that terminates the call. The originating ILEC's network costs plus the compensation it pays is—in theory—recovered from the local call charge it levies on its (originating) customer. The terminating CLEC's costs are recovered from the compensation payment it receives from the originating ILEC. In this arrangement, both parties recover their costs, and the cost-causer is (again, in principle) billed for the entire cost he or she causes both carriers to incur. Thus, this arrangement is not an arbitrary regulatory or legal construction: for local interconnection between an ILEC and a CLEC, it makes economic sense. It would arise spontaneously in unregulated competitive markets where the ILEC serving the originating subscriber acts effectively as its agent in making necessary network and financial arrangements with a CLEC to terminate the call, just as General Motors purchases goods or services from Ford or Bendix to include in an automobile purchased by a General Motors customer.

ILEC-IXC Interconnection Model. In contrast, when a Qwest subscriber places a long distance call using, *e.g.*, AT&T, Qwest's function is limited to recognizing the carrier code (or implementing presubscription in its switch) and switching and transporting the call to AT&T's point of presence. While, at some level, the functions its network performs are similar to those used to deliver local traffic to a CLEC[10], the economic functions are very different. It is AT&T that has marketed the service to its customer and determined both the price level and structure and other terms and conditions of the call. AT&T will send, explain, and

[10] Qwest supplies the customer's loop and provides dialtone, local switching, and transport to AT&T's point of presence.

collect the bill from the customer or lose the revenue if it cannot. Thus, under ILEC-IXC interconnection, the originating subscriber is, from an economic perspective, the customer of the IXC, not the originating ILEC.

When an ILEC (or CLEC) subscriber places long distance calls, he acts as a cost-causing customer of the IXC. The ILEC subscriber, acting as an IXC customer, causes costs at various points in the networks involved: for the ILECs/CLECs that originate and terminate the long distance call, as well as for the IXC that transports it between local exchanges. The IXC receives revenue from the customer which it uses, in turn, to pay originating and terminating access charges to the ILECs/CLECs involved and to cover its own network and administration costs. In effect, the IXC acts as its customer's agent in assembling the necessary local exchange components of the call. The ILECs/CLECs involved recover their costs from access charges. Thus, in principle, the cost-causing customer faces a price that reflects all of the costs the call engenders, and all parties that incur costs to provision the call have a claim on the cost-causer's payment.

From an economic perspective, ILEC-IXC interconnection and ILEC-CLEC interconnection have both important similarities and differences. In both cases, the originating ILEC subscriber is the cost-causer and pays the supplier for the end-to-end service. The major difference is that in the ILEC-CLEC local interconnection regime, the cost-causing ILEC subscriber is also a customer of the originating ILEC for local service, while in the ILEC-IXC regime, that cost-causing subscriber acts as a customer of the IXC for long distance service.

Q. FROM AN ECONOMIC PERSPECTIVE, WHY DOES ILEC-CLEC-ISP INTERCONNECTION RESEMBLE THAT BETWEEN THE ILEC AND THE IXC BUT NOT THAT BETWEEN THE ILEC AND THE CLEC?

A. The question at issue is: when multiple ILECs/CLECs combine to deliver traffic to an ISP, are they interconnecting in an ILEC-CLEC local interconnection regime or an ILEC-IXC interstate access regime? The FCC has characterized the link from an end-user to an ISP as an *interstate* access service and, absent other considerations, ISPs would be subject to charges analogous to interstate access charges. As far back as 1983, the FCC concluded that ESPs (which, today, would include ISPs) are "among a variety of users of access service" in that they "obtain local exchange services or facilities which are used, in part or in whole, for the purpose of completing interstate calls."[11]

The service provided by an ISP exists to enable that ISP's customers to access information and information-related services stored on special computers or web servers at various locations around the world. The ISP typically facilitates such access by selling a flat-rated monthly or yearly Internet access service that, in most cases, calls for that ISP customer to make a local or toll-free call in order to reach the ISP's modems. Besides price, ISPs compete on the extent of geographic coverage, specifically, the number of local calling areas they can offer to ISP customers as possible POCs, as well as on various components of service

[11] *MTS/WATS Order.*

quality including provision of specialized information services. The ISP markets directly to the originating ILEC's subscriber, attempting to maximize its number of customers and the amount of traffic *incoming* to it by publishing and advertising as many local calling numbers (at its POCs) as possible, and doing everything within its power to help the potential customer avoid having to incur per-minute or toll charges to have Internet access. If necessary, ISPs may use foreign exchange ("FX") lines to haul Internet traffic from considerable distances while still offering service to the ISP customer for the price of a local call.[12] Some ISPs offer 800 service for their customers to access their network when flat-rate local calling is unavailable, although there are some which impose a per-minute charge on the subscriber for such access. Some ISPs maintain Internet gateways for their customers and earn revenue from advertisers that depend more or less directly on the number of customers and the number of times its customers access advertised sites. The ISP bills its customers for their access and usage, and stands to lose money if it cannot collect from them. From an economic perspective, then, the party that causes the cost associated with Internet-bound traffic is the originating ILEC's subscriber who acts in the capacity of an ISP customer. In this sense,

[12] In that respect, the implicit contract is analogous to that which exists between a party with a toll-free "800" telephone number and other parties that are invited to call that number. The holder of the 800 number causes cost by signaling others to call him or her and accepts that cost by being willing to pay for it. Moreover, the holder of the 800 number may control the number of potential callers by choosing the method for disclosing the number (e.g., directory information, word of mouth, special invitation, etc.). Similarly, ISPs that use FX lines to provide local connectivity to distant customers signal a willingness to accept—and pay for—the generally higher cost of providing Internet access to those customers. They too can control the number of potential ISP customers by choosing both how many

(continued...)

Internet-bound traffic has the same characteristics as IXC-bound traffic in the ILEC-IXC regime and has characteristics opposite to CLEC-bound traffic in the ILEC-CLEC local interconnection regime.

Q. ARE THERE DIFFERENCES BETWEEN AN IXC-BOUND CALL AND AN INTERNET-BOUND CALL?

A. A theoretical difference is that an ILEC subscriber that places a long distance call does not incur a local usage charge on the originating end, while an ISP customer, in principle, does. As a practical matter, however, this difference is irrelevant. Flat and measured basic local exchange rates have *not* been set to reflect the added cost of serving Internet-bound traffic, and a longstanding public policy concern with the level of basic exchange rates limits the ability of the regulator to recover these costs from all local exchange customers.[13] In addition, ISPs compete, in part, by providing local exchange numbers so that their customers can reach them without incurring per-minute charges from the serving ILEC or CLEC. Because Internet-bound traffic is caused by the ISP's customer, the ISP would generally bear the cost of the local connection, just as the IXC does for long distance traffic. And, in fact, competitive forces in the ISP market have encouraged ISPs to incur costs and

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(...continued)

points of connection to offer for providing local connectivity and pricing options for its Internet access service.

[13] Indeed, because the longer holding times of Internet-bound traffic impose costs different from those for ordinary voice traffic, raising prices for all local exchange customers to recover costs imposed by the ISP's customers would constitute a subsidy to ISP access. ILECs that originate Internet-bound (continued...)

lease facilities so that their customers do not pay additional local exchange costs. For both of these reasons, it would be naïve to think that the originating ILEC's subscriber fully compensates that ILEC for the end-to-end cost of the Internet-bound call.[14]

Thus, I conclude that the ILEC should not be required to pay reciprocal compensation (or, a call "termination" charge) to CLECs for Internet calls by the ILEC subscriber, i.e., the ILEC-CLEC local interconnection regime should not apply for such calls. Instead, I conclude that the ISP should pay the ILEC (and the CLEC that also serves it) usage charges analogous to carrier access charges paid by IXCs, i.e., the ILEC-IXC interconnection regime should apply. Only such a payment would close the gap between the full cost of the call up to the ISP and the local call charge that is assessed to the end-user by the originating ILEC. In this economically correct view of inter-carrier compensation, the CLEC that switches Internet calls for the ISP is compensated not from reciprocal compensation paid by the originating ILEC but from charges paid by the ISP. Moreover, this economically correct perspective does *not* depend on the exact jurisdictional status of the ISP-directed call.

(...continued)

traffic would effectively charge ISP customers less than incremental cost and ordinary voice customers more than otherwise for local exchange usage.

[14] This problem is likely to be even more acute when the ILEC's subscriber pays flat-rated local charges rather than per-call rates for local service.

Q. HOW DOES THE RATIONALE FOR THE ESP EXEMPTION FROM ACCESS-LIKE CHARGES APPLY TO THE INTER-CARRIER COMPENSATION ISSUE CURRENTLY BEFORE THIS COMMISSION?

A. If per-minute reciprocal compensation were required, ILECs would be in roughly the same position as the ESPs were when the exemption went into effect. Under reciprocal compensation, ILECs would have to pay the per-minute cost of transport and termination for Internet-bound traffic to CLECs that disproportionately serve ISPs. Where ESPs were thought to be unable to recover those costs from their customers because a per-minute charge would discourage use of the new technology, ILECs are similarly likely to be unable to recover those costs from their own subscribers. This is particularly likely when state regulators are reluctant to increase basic exchange rates to *all* customers in order to recover the cost increases that are caused only by the subset of dial-up Internet customers.

Second, when ISPs are served by CLECs, ILECs experience an additional net cost from reciprocal compensation. To understand why, consider that reciprocal compensation for local voice traffic is based on the ILEC's unit termination cost for that traffic. The same compensation rate applies to both the ILEC and the CLEC *even if* the CLEC's own unit termination cost is different from that of the ILEC. What would be the effect of extending the same compensation mechanism to Internet-bound traffic? The ILEC's unit termination cost for *local voice* traffic—to which the compensation rate is pegged—would very likely be *higher* than the CLEC's unit cost to deliver Internet-bound traffic to the ISP.[15] This fact is crucial because the cost that the ILEC actually avoids (by having the CLEC deliver Internet-bound traffic to the ISP instead) would then be lower than its own unit termination cost for local voice traffic and, hence, the compensation rate it has to pay. As a result, the ILEC would pay more (even significantly so) in reciprocal compensation than the costs they would avoid from the CLEC delivering Internet-bound traffic to the ISP. To recover this additional cost directly, the ILEC may be compelled to bill its own subscribers for the difference, but *only* if those subscribers are also customers of the ISP that is served by the CLEC. When the ISP is served by the ILEC instead, subscribers of that ILEC would not generate additional costs from reciprocal compensation and thus should not have to pay for them.

The bottom line is that dial-up customers of CLEC-served ISPs impose more cost on ILECs than dial-up customers of ILEC-served ISPs. However, while there may be a cost justification for charging local subscribers differently depending on which local exchange carriers serve their ISPs, in reality such differential pricing is unlikely to be practical or politically acceptable.

Thus, under reciprocal compensation for Internet calls, the ILEC is in the very position from which the ESP exemption was designed to protect ESPs: subject to a per-minute cost for which it has no practical mechanism for recovery. Ironically, the fact that the ILEC has no ability to recover the costs of reciprocal

[15] I explain below why this may be so.

compensation from the cost-causer is sometimes touted as an advantage of the plan. However, creating a new, additional implicit subsidy in ILEC local exchange rates is hardly wise public policy just as local exchange competition begins to accelerate.

Q. SOME OBSERVERS CLAIM THAT INTERNET-BOUND TRAFFIC AND LOCAL VOICE TRAFFIC ARE "FUNCTIONALLY IDENTICAL" BECAUSE THEY USE THE SAME NETWORK COMPONENTS. DOES THIS CLAIM JUSTIFY APPLYING RECIPROCAL COMPENSATION TO INTERNET-BOUND TRAFFIC?

A. No. First, there has to be a distinction—of the kind drawn by the FCC—between a local voice call and a call to an Internet site. Unlike the voice call, the Internet call does not terminate within the CLEC's network but, rather, continues on through the Internet backbone to its ultimate destination. Therefore, when viewed from end to end, an Internet call—which treats the ISP as a point of passage into the Internet's packet-switched world—is essentially quite different in many aspects than a voice call, even if it is similar in others.

Second, the implicit premise of the question itself is incorrect because it ignores cost causation. There are cost-causative differences between Internet-bound traffic and ordinary local traffic despite a superficial functional resemblance between *parts of* the two types of traffic. From an economic perspective, the ILEC-CLEC model of inter-carrier compensation does not apply to Internet-bound traffic, and reciprocal compensation between local exchange co-carriers is not an efficient method of recovering costs. Moreover, any observation that Internet-bound traffic and local traffic use the same network elements is fundamentally a red herring. Technical characteristics of production or the level of cost may be items of interest in themselves, but they are entirely irrelevant for determining who should be made to pay for the cost. Even if the two types of traffic were functionally identical—which they are not—and generated the same level of cost, it would still be economically inappropriate to apply reciprocal compensation to both.

Third, if the cost *per minute* to terminate a local voice call were truly the same as that cost an Internet-bound call imposes on a CLEC, then the adverse economic effects of reciprocal compensation would not be as severe, although reciprocal compensation for that call would remain unjustified. However, the costs per minute for the two types of calls are *not* likely to be the same because of significant differences between them in average call durations, time-of-day load distributions, and the effects of one-to-one concentration at the switch that serves the ISP.

Q. WOULD THIS FORM OF COMPENSATION DENY A CLEC FAIR PAYMENT FOR USE OF ITS NETWORK BY AN INTERNET-BOUND CALL FROM A QWEST SUBSCRIBER?

A. Absolutely not. The point at issue here is whether it should be up to *Qwest* (the ILEC) to compensate the CLEC for the cost the latter incurs in carrying Internet calls to ISPs it serves. While the CLEC is entitled to recover fully the cost it incurs for Internet-bound calls, such recovery (compensation) ought to come—in accordance with cost causation—from the ISP or ISPs it serves, not from Qwest.

To have it otherwise—particularly in current circumstances in which CLECs are believed to share reciprocal compensation revenues with the ISPs they serve—would only reinforce the perverse incentive to specialize in providing "termination" services for ISPs (to the exclusion of virtually all other local exchange services) or to generate as much traffic as possible from Qwest's subscribers to ISPs with which those CLECs are allied.[16]

Q. IN THE ABSENCE OF FCC ACTION TO ESTABLISH INTER-CARRIER COMPENSATION RULES, HOW HAVE THE INDIVIDUAL STATES ACTED?

A. For a period of time until the FCC's *Internet Traffic Order* was issued in early 1999, a number of states pursued their own rulemaking on the issue. Those states chose to adopt the ILEC-CLEC local interconnection view of the world and required that the originating ILEC pay reciprocal compensation to terminating CLECs for Internet-bound calls just as they would for local voice calls. After the FCC's *Internet Traffic Order* was issued, regulators in Massachusetts, who had previously also adopted the local interconnection view, reversed themselves and declared the unqualified payment of reciprocal compensation for Internet-bound traffic to be

[16] Both the Massachusetts DTE (*Massachusetts ISP Compensation Order*, Section IV and fn. 39) and the FCC (*Internet Traffic Order*, ¶24, fn. 78) took note of—and expressed concern at—that development. Both noted, in particular, the web site claims of ISG-Telecom Consultants International, a Florida-based company formed in the aftermath of the Telecommunications Act of 1996 ("1996 Act"), that promises to turn ISPs into CLECs and IXCs with their own ISP operations. As a rationale for doing so, ISG-Telecom believes that "... as a facility based CLEC, the ISP/CLEC should be able to participate in *reciprocal compensation* with the carriers, providing there is not a negative ruling from the FCC in up and coming months." (emphasis added in part) Clearly, arbitrage opportunities presented by the payment of reciprocal compensation for Internet-bound traffic, not an inherently efficient network arrangement, lies at the heart of this mission statement.

antithetical to real competition in telecommunications.[17] Subsequently, regulators in New Jersey, in reversing an arbitrator's recommendation in October 1998, also ordered that reciprocal compensation not be paid for Internet-bound traffic.[18] Regulators in South Carolina[19] and Louisiana,[20] too, have directed that such compensation not be paid. Recently, Massachusetts regulators dismissed petitions by several CLECs for a reconsideration of their May 1999 ruling against reciprocal compensation for Internet-bound traffic and called on the parties to negotiate alternative compensation mechanisms for such traffic.[21] More recently, the Colorado Commission explicitly adopted the ILEC-IXC interconnection model for Internet-bound traffic in support of its decision opposing the payment of reciprocal compensation for Internet-bound traffic.[22] This Commission followed suit by opting

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[17] Massachusetts Department of Telecommunications and Energy ("DTE"), *Complaint of MCI WorldCom, Inc., Against New England Telephone and Telegraph Company d/b/a Bell Atlantic-Massachusetts for Breach of Interconnection Terms Entered Into Under Sections 251 and 252 of the Telecommunications Act of 1996*, Docket No. 97-116-C, Order ("*Massachusetts ISP Compensation Order*"), May 1999. The DTE ordered that all future reciprocal compensation payments by Bell Atlantic be placed in an escrow fund until final disposition on the matter of inter-carrier compensation. The CLECs serving ISPs in Massachusetts currently do not themselves receive any compensation for Internet-bound traffic.

[18] New Jersey Board of Public Utilities, *In the Matter of the Petition of Global Naps, Inc. for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Bell Atlantic-New Jersey Pursuant to Section 252(b) of the Telecommunications Act of 1996*, Docket No. T098070426, Order, July 7, 1999.

[19] South Carolina Public Service Commission, *In re Petition for Arbitration of ITC^DeltaCom Communications, Inc. With BellSouth Telecommunications, Inc. Pursuant to the Telecommunications Act of 1996*, Docket No. 1999-259-C, Order No. 1999-690, Order on Arbitration, October 4, 1999.

[20] *Louisiana ISP Compensation Order.*

[21] "Mass. 'Recip Comp' Order Brings GNAPs, Bell Atlantic Back to FCC," *Telecommunications Reports*, March 6, 2000, at 30.

[22] See fn. 7, *supra*.

for bill-and-keep over reciprocal compensation.[23] Finally, two very recent events are worth noting. Iowa has reaffirmed its preference for bill-and-keep over reciprocal compensation for Internet-bound traffic.[24] Similarly, South Carolina has reaffirmed in the recently concluded AT&T-BellSouth interconnection arbitration what it had decided in the 1999 ITC DeltaCom-BellSouth interconnection arbitration: no reciprocal compensation is due for Internet-bound traffic.[25]

Q. DID ANY OF THE STATE COMMISSIONS BASE ITS REJECTION OF RECIPROCAL COMPENSATION FOR INTERNET-BOUND TRAFFIC ON THE TYPE OF ECONOMIC ANALYSIS YOU HAVE PROVIDED?

A. Yes. Massachusetts regulators were first to recognize the perverse incentives of reciprocal compensation for Internet-bound traffic (an issue I return to later). The Colorado Commission relied more directly on the economic analysis I have outlined.

> The Commission finds that U S WEST's analogy is the more reasonable....The ILEC-IXC analogy suggests that the ISP should compensate both U S WEST and Sprint for the costs they incur in transmitting this call. Even if that analogy were not employed, applying the principle of cost causation would lead to the same conclusion, namely that the ISP should pay access charges to both U S WEST and Sprint for the cost caused by the customer....

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[23] See fn. 6, *supra*.

[24] Iowa Utilities Board, *In re Arbitration of Sprint Communications Company L.P., and U S WEST Communications, Inc., n/k/a Qwest Corporation*, Docket No. ARB-00-1, Arbitration Order, December 21, 2000.

[25] South Carolina Public Service Commission, *In re Petition of AT&T Communications of the Southern States, Inc, for Arbitration of Certain Terms and Conditions of a Proposed Interconnection Agreement with BellSouth Telecommunications, Inc. Pursuant to 47 U.S.C. Section 252*, Docket No. 2000-527-C, Order No. 2001-079, Order on Arbitration, January 30, 2001.

> While ISP calls appear to be interstate in nature, our conclusion is not necessarily based upon that determination. Even if this traffic were considered to be local in nature, the Commission still would not embrace reciprocal compensation with a positive rate. Such a scheme would, in our view, bestow upon Sprint an unwarranted property right, the exercise of which would result in decidedly one-sided compensation. In addition, we find that reciprocal compensation would introduce a series of unwanted distortions into the market. These include: (1) cross-subsidization of CLECs, ISPs, and Internet users by the ILEC's customers who do not use the Internet; (2) excessive use of the Internet; (3) excessive entry into the market by CLECs specializing in ISP traffic mainly for the purpose of receiving compensation from the ILECs; and (4) disincentives for CLECs to offer either residential service or advanced services themselves. In short, we agree with U S WEST that reciprocal compensation for ISP traffic would not improve overall social welfare; it would simply promote the welfare of some at the expense of others.[26]

C. The Cost of Internet-Bound Traffic

Q. ARE THE FACILITIES USED TO TRANSPORT AND SWITCH AN INTERNET-BOUND CALL SIMILAR TO THOSE USED TO TRANSPORT AND SWITCH OTHER TYPES OF CALLS?

A. The costs for transporting and switching traffic are not determined by *what* network elements are used—they are determined by *how* the network elements are used. Therefore, while the facilities used to transport and switch an Internet-bound call are similar to those used to transport and switch other types of calls, there are characteristics of Internet-bound traffic that make the *cost* of transport and switching (as measured by TELRIC) different for Internet-bound calls. The major differences are:

[26] *Colorado ISP Order*, ¶C(j).

- *Call Duration*: Because Internet-bound calls are much longer, on average, than local voice calls, the per-minute cost of call setup is much lower for the Internet-bound call than for the average voice call.
- *Call Direction*: Transport and termination costs involve only terminating traffic. Some features and functions impose capacity costs only at the originating end and would not be included in a study of cost to Sprint of delivering Internet-bound traffic to ISPs.
- *Use of Network Elements*: Because dedicated circuits are used for Internet-bound traffic, traffic-sensitive switching costs are lower for Internet-bound traffic than they are for voice traffic.
- *Load Distribution*: The proportion of Internet-bound traffic that arrives at the busy hour of the switch may differ from that of ordinary voice traffic. If the load distribution of Internet-bound traffic is flatter than that of voice traffic and peaks at a different hour, then the average incremental minute of Internet-bound traffic would cause a smaller increase in the capacity requirements of the switch than an incremental minute of voice traffic.

Thus, even though similar facilities are used to switch and transport Internet-bound and voice traffic, the TELRIC of Internet-bound traffic can differ significantly from the TELRIC of average local exchange traffic, which currently determines the reciprocal compensation rate for local voice traffic.

Q. PLEASE EXPLAIN THE IMPACT OF CALL DURATION ON COSTS.

A. For every call, there are broadly two types of cost: a *fixed* cost (invariant to the length of the call) for call setup at both ends of the call, and an incremental or *variable* cost that arises for every minute a call passes through a switch. The full *per minute* cost of that call is the sum of the variable cost of that minute plus the fixed cost averaged over the total length of the call. The latter component would obviously diminish as the fixed cost is averaged over an increasing number of minutes. Thus, if the average Internet-bound call is about five to thirteen times longer than the average voice call,[27] the *average* fixed cost component for the former would be considerably smaller than that for the latter. *Even if* the variable cost component of both types of calls were the same, the *per minute* cost of the average Internet-bound call would still end up being considerably less than that for the average voice call. A simple numerical example illustrates this fact.

Suppose the variable cost for each minute is 0.5¢ (for ease of exposition, it is assumed to be constant for all minutes). Then, a 3-minute call would have a total variable cost of $3 \times 0.5 = 1.5$¢ and a 20-minute call would have a total variable cost of $20 \times 0.5 = 10$¢. Suppose the fixed cost of call setup—which does not vary with the length of the call—is 2¢. Then the *total* cost of the 3-minute call (inclusive of call setup) would be $1.5+2 = 3.5$¢, and that for the 20-minute call would be $10+2 = 12$¢. To figure what each call costs on a per-minute basis, simply divide the total cost of each by the respective number of minutes. Thus, the 3-minute call would cost $3.5 \div 3 = 1.17$¢ per minute and the 20-minute call would cost $12 \div 20 = 0.6$¢ per minute. That is, as the call duration increases, the cost per minute would fall.

Q. PLEASE EXPLAIN HOW THE LOAD DISTRIBUTION OF TRAFFIC AFFECTS COSTS.

A. The cost drivers for transmitting or terminating any type of traffic (e.g., Internet-bound traffic, local traffic, toll) include the number and duration of calls in the busy hour. Incoming call attempts during the busy hour for the CLEC switch determine

[27] See, e.g., Susan Biagi, "A Tale of Two Networks," *Telephony*, August 3, 1998.

the capacity requirements for the switch components involved in call setup, namely, the central and peripheral processors and measurement equipment. Call duration during the busy hour determines the capacity requirements for the line and trunk equipment in the switch that are used to set up a path for the call.

It is likely that the load distribution of ISP traffic—number and duration of calls in the busy hour as a percent of total traffic—differs from that for other types of calls. The peak hour for voice traffic normally occurs some time during the business day. Internet-bound traffic is likely to have a flatter load distribution due to the nature of demand. Whereas the business day is confined approximately to an eight hour period with little evening or weekend activity, consumers frequently use the Internet during the evening and weekends. These usage patterns flatten the load distribution for ISP traffic, in the sense that the fraction of usage falling in the busy hour is smaller for Internet-bound traffic than for ordinary voice traffic. This means that Internet-bound traffic requires less investment and costs per minute to provide capacity to meet peak demand than does ordinary voice traffic.

Q. PLEASE EXPLAIN HOW THE USE OF NETWORK ELEMENTS AFFECTS TRANSPORT AND SWITCHING COSTS DIFFERENTLY FOR INTERNET-BOUND TRAFFIC THAN FOR LOCAL VOICE TRAFFIC.

A. The cost analyst must examine not only *which* network elements are used to provide a service, but also *how* they are used. Rates set for inter-carrier compensation of any type of traffic must recover only the costs that are traffic-sensitive, i.e., vary with additional usage. Non-traffic sensitive costs, i.e., costs that do not vary with additional usage, *should not be so recovered.* This follows as a matter of general economic principle and as a requirement of the Telecommunications Act of 1996 which states in Section 252(d)(2) that prices for the "transmission and routing of telephone exchange service and exchange access" be based on incremental costs.

It is important to consider how network elements are used for different types of traffic because differences in such use can affect not only the level of costs but, more importantly, the manner in which the costs should be recovered. The same network element that may appear to be a shared facility in certain uses can turn out to be a dedicated facility in other uses. In the former case, the cost of the facility would be recovered from all customers using that facility and, in the latter case, it would be recovered from the single cost-causing customer.

Q. PLEASE ELABORATE UPON THIS POINT.

A. An examination of the typical line-to-trunk concentration ratio for different types of traffic shows why it is incorrect to conclude that the costs for different types of traffic are the same merely because identical network elements are used. An important part of switch investment costs is the busy hour line CCS (hundred call seconds) costs. Busy hour line CCS is a measure of the type of concentration required on the line side of the switch and is determined by the number of line circuits sharing a trunk circuit and a circuit path through the switch processor. A concentration ratio of 8:1, for example, means that eight line circuits share one trunk circuit and one circuit path through the switch processor.[28] Using basic engineering guidelines, the switch is sized and engineered, i.e., a concentration ratio is determined, to accommodate a certain level of traffic so that a minimum level of blocking occurs if traffic volume during the busy hour is higher than the volume suggested by the concentration ratio that is chosen. For traditional voice traffic, busy hour line CCS costs are traffic-sensitive in nature because they arise from a shared facility. namely, one circuit path through the switch processor that is shared by eight customer lines. Because of that sharing, the use of the facility during the peak hour imposes congestion costs on other users in the form of rationing or call-blocking. Since line CCS costs arise from a resource that is shared by various users, a recovery mechanism that apportions cost to those cost-causing users provides proper signals at the margin and increases economic efficiency.

Line CCS costs for Internet-bound traffic, however, are not traffic-sensitive. CLECs which focus on Internet traffic rely on ISDN Primary Rate Interfaces ("PRI") to serve ISPs and build switches at a concentration ratio of 1:1. For those carriers, line CCS costs are fixed with respect to usage. Each line serving an ISP has a *dedicated* path through the switch processor and increased usage from other lines does not impact the use of the line serving the ISP. No matter what the demand is from other lines, the path serving the ISP will always be available for customers

[28] An ordinary voice loop is generally engineered for 3 CCS at the busy hour, while the interoffice trunks that concentrate those loops are engineered for about 27 busy hour CCS. Thus, for ordinary voice (continued...)

calling the Internet. Since the circuit is dedicated to the ISP line, the use of the facility does not impose congestion costs on other users and no rationing or call blocking is imposed on the network as a result. Although the same network elements are used for local voice traffic, inter-carrier compensation for Internet-bound traffic should not include line CCS costs because those costs do not vary with additional usage and are, therefore, not incremental costs of delivering Internet-bound calls.

D. Reciprocal Compensation for Internet-Bound Traffic Harms Economic Efficiency and Distorts Local Exchange Competition

Q. WHY WOULD THE ILEC-CLEC LOCAL INTERCONNECTION REGIME WITH PAYMENT OF RECIPROCAL COMPENSATION FOR INTERNET-BOUND TRAFFIC HARM ECONOMIC EFFICIENCY AND FAIL TO PROMOTE TRUE COMPETITION?

A. The harm to economic efficiency in an ILEC-CLEC local interconnection regime with payment of reciprocal compensation for Internet-bound traffic occurs for three reasons:

1. Inefficient subsidization of Internet users by non-users.
2. Distortion of the local exchange market.
3. Creation of perverse incentives to arbitrage the system at the expense of basic exchange ratepayers.

(...continued)

traffic, it is not unusual to observe 8 or 9 loops for every trunk.

1. Inefficient Subsidization

Q. PLEASE EXPLAIN HOW THE ILEC-CLEC INTERCONNECTION REGIME FOR INTERNET-BOUND TRAFFIC COULD CAUSE INEFFICIENT SUBSIDIZATION OF INTERNET USERS BY NON-USERS.

A. The principle of cost causation requires that the *ISP customer* pay at least the cost his call imposes on the circuit-switched network.[29] Suppose inter-carrier compensation for Internet-bound traffic is treated as in the ILEC-CLEC interconnection regime. This regime assumes at the outset that the customer initiating the call has paid the originating ILEC for the end-to-end carriage of the call, typically, the per-call equivalent of the local call charge. Out of what it receives, the ILEC then pays reciprocal compensation to the CLEC that carries the Internet call to the ISP. This compensation is a per-minute call "termination" charge which, ideally, should reflect the incremental cost that the ILEC *avoids* by not having to deliver the call itself. In this scenario, problems can emerge from two sources.

First, if the local call charge is itself not compensatory, i.e., below the incremental cost of carrying a local voice call from end to end, then it cannot be sufficient to allow recovery of both the ILEC's incremental cost to originate the call and the CLEC's incremental cost to deliver the call. In other words, once reciprocal compensation has been paid, the ILEC would fail to recover its cost of carrying the

[29] It is assumed that the cost imposed by that customer for the packet-switched network portion of the Internet call is recovered through monthly access charges by the ISP serving that customer.

Internet-bound call when the local call charge itself is non-compensatory or inefficient. If the ILEC still manages to break even for *all* of its services in these circumstances, that could only mean that Internet use (for which the cost exceeds revenue) must be being subsidized by non-Internet and, most likely, non-local exchange services. This scenario is likely to play out whenever, in order to promote universal service, the local residential call charge in a state is set below the incremental cost of that call.

Second, if the per-minute cost to deliver an Internet-bound call is *less* than the per-minute cost to terminate the average voice call (on which most reciprocal compensation arrangements are based), then the CLEC would actually earn revenue in excess of its cost. Even if the local per-call charge were compensatory, the ILEC could still end up with a higher cost liability than necessary or economically efficient (the sum of its own originating cost and the CLEC's inflated termination charge). If the CLEC could then funnel back some of the excessive compensation so received to the ISP or the Internet user through, e.g., lower monthly charges for Internet use, then the *net* price paid for the ISP call would be below the cost imposed on the originating ILEC.[30] This would be equivalent to receiving a subsidy.

This form of subsidization of Internet use within the circuit-switched network would stimulate demand for Internet services inefficiently and further aggravate the

[30] See fn.16, *supra*.

ILEC's tenuous position under the ILEC-CLEC interconnection regime. Additional negative consequences would be (1) greater congestion at local switches engineered for voice traffic generally and, as a result, poorer quality of voice traffic, and (2) CLECs making the opportunistic choice to specialize only in the delivery of Internet-bound traffic. I discuss the resulting distortion of the local exchange market below.

Q. WHEN INTERNET-BOUND TRAFFIC IS ALMOST ENTIRELY ONE-WAY (FROM QWEST'S SUBSCRIBERS TO ISPs SERVED BY CLECs), WHAT PRACTICAL EFFECT IS LIKELY FROM REQUIRING QWEST TO PAY RECIPROCAL COMPENSATION FOR SUCH TRAFFIC?

A. One often overlooked practical effect of the continued requirement to pay reciprocal compensation despite such traffic imbalance[31] is the likely ultimate pressure on Qwest's prices for retail services, including residential local exchange service. Under current practice, Qwest is allowed to collect a flat monthly amount from each of its residential customers for local exchange service. In principle, this amount is supposed to compensate Qwest, on average, for the actual cost of providing that service to each customer. In the U.S., however, it is commonplace to encourage greater subscribership by setting the monthly (flat-rated) price of local exchange service to residential customers affordably low and frequently *below* the incremental cost to serve each customer. The revenue deficit which results from

[31] Traffic is said to be "balanced" when originating and terminating volumes are similar.

this is usually made up with implicit (i.e., price-based) subsidies from other services offered—often competitively—by the ILEC. To the extent that Qwest is not exempted from this practice, *any* addition to that incremental cost can only exacerbate the revenue deficit from local exchange service and compel Qwest to seek recovery by raising *further* its prices for retail services, including residential local exchange service.

The fact is that residential local exchange service prices were never set with the additional and, generally, large Internet traffic-related costs in view. Even if reciprocal compensation rates were properly set so that Qwest only paid the CLEC the cost it *actually* avoided to deliver traffic to ISPs, Qwest could never escape the growing spiral of network facilities-related costs it would have to incur in order to serve the ever-increasing volumes of one-way Internet-bound calls made possible by the perverse incentives presented to ISP-serving CLECs by reciprocal compensation revenues.[32] Faced with having to recover costs seriously in excess of revenues available from residential local exchange service, Qwest would have little choice but to petition this Commission for increases in the price of residential local exchange service in Arizona. Raising other retail service prices to effect such recovery may also be an option, but one fraught with two serious problems. First, as those other services become increasingly competitive in the market, raising their prices, rather than lowering them, will prove untenable and counter-productive for

[32] I explain the perverse incentives issue in greater detail later in my testimony.

Qwest. Second, raising those other service prices will only continue, rather than mitigate, the current practice of relying on extensive implicit subsidies in the pricing of telecommunications services. The 1996 Act made it very clear that those implicit subsidies are to be removed as expeditiously as possible.

2. Market Distortions

Q. PLEASE EXPLAIN HOW THE PAYMENT OF RECIPROCAL COMPENSATION FOR INTERNET-BOUND TRAFFIC COULD CAUSE THE LOCAL EXCHANGE MARKET TO BE DISTORTED.

A. Under the ILEC-CLEC interconnection regime, the compensation paid to CLECs *for Internet-bound traffic* evidently exceeds their cost of delivering such traffic and also exceeds whatever costs Qwest might save when CLECs deliver that traffic on its behalf. That such compensation for Internet-bound traffic does not reflect costs should not be surprising. In Arizona, compensation is based on Qwest's forward-looking total element long run incremental cost ("TELRIC") of terminating traffic averaged over a wide range of end-users, services, and service locations. This has important implications for setting compensation for *Internet-bound calls* on the same basis.

First, the per-minute *incremental* cost of terminating or delivering traffic to particular end-users can vary a great deal, depending upon their location and the characteristics of the traffic. Second, because of average call durations, the *full* per-minute cost of termination (inclusive of both incremental and fixed costs) for averaged voice traffic is typically higher than the full per-minute cost of delivering Internet-bound traffic.

When traffic between the ILEC and the CLEC is balanced, the accuracy of the estimated underlying cost of termination as the basis for reciprocal compensation is less material. Because the same compensation rate applies in both directions, any overpayment (or underpayment) by an ILEC to terminate traffic on the CLEC's network is offset by a corresponding overpayment (or underpayment) by the CLEC to terminate traffic on the ILEC's network. Thus, when traffic is balanced, no individual ILEC or CLEC is helped or handicapped in competing for retail customers in the local exchange market by the requirement that interconnection compensation be based on costs averaged over all customers.

However, when traffic between the ILEC and the CLEC is grossly unbalanced, e.g., when the CLEC terminates traffic from the ILEC but returns little or no traffic to it, the accuracy of the cost-based compensation becomes critical. Suppose, for simplicity, Qwest's own cost to deliver Internet traffic to an ISP that it serves is the same as the cost experienced by a specialized CLEC that serves a collocated ISP. That is, Qwest's own cost of carrying Internet-bound traffic is the same as the cost it avoids when a CLEC handles such traffic instead. If Qwest is then required to pay reciprocal compensation for Internet-bound traffic at an averaged cost-based rate that reflects *all* forms of local traffic, its total cost of local service would necessarily be higher than if compensation levels were properly tied to the *type*—hence, the cost—of traffic terminated. This cost increase would not be offset by a similar increase in revenue from handling the CLEC's Internet-bound traffic (because the CLEC does not originate any traffic). Thus, local exchange competition would be distorted by the inapplicability of the averaged cost-based compensation to ISP traffic; CLECs that primarily serve ISPs (and originate little or no traffic) would receive revenues in excess of cost while ILECs (or even other CLECs) that serve all types of customers would experience an increase in costs without a commensurate increase in revenues.

Q. DOES THAT MEAN THAT RECIPROCAL COMPENSATION IS ILL-ADVISED BECAUSE TRAFFIC BETWEEN THE ORIGINATING ILEC AND THE CLEC THAT DELIVERS ISP TRAFFIC IS UNBALANCED?

A. Yes, but the problem here is not simply that traffic is unbalanced. Reciprocal compensation was never envisioned as appropriate inter-carrier compensation for essentially one-way traffic. This is particularly true when the true cost to terminate for the carrier that only *receives* traffic is actually lower than the termination cost (experienced by the carrier that *sends* traffic) on which a symmetrical compensation arrangement is based. But, even with balanced traffic, requiring reciprocal compensation payments for Internet-bound calls would violate the economic principle of recovering cost in accordance with cost causation.

Q. WOULD RECIPROCAL COMPENSATION FOR INTERNET-BOUND TRAFFIC DISTORT LOCAL COMPETITION?

A. Yes, in two ways. First, since end-users that generate Internet-bound traffic would not pay the full incremental cost of carrying it, LECs would have an incentive to avoid competing to serve such customers. As most switched Internet-bound traffic comes from residential users, the incentives to compete to serve residential users would be artificially diminished. Second, the ISPs themselves are better off if their customers obtain their local telephone service not from the CLECs that deliver ISP-only traffic but from the ILEC or other CLECs that do not serve ISPs. Suppose, for example, the ILEC serves 95 percent of the residential local exchange traffic in a market. If an ISP obtained access service from the ILEC, only 5 percent of its traffic would generate reciprocal compensation payments. If it signed up with a CLEC, 95 percent of its traffic would generate such payments. When the reciprocal compensation price exceeds the CLEC's cost to handle the traffic, this imbalance gives it a strong financial incentive to seek access service from CLECs as opposed to ILECs. This creates a further distortion in the local exchange market, contrary to the vision of competition embodied in the 1996 Act.

It is not surprising, therefore, that the DTE in Massachusetts felt compelled to opine:

> We note also that *termination* of the obligation for reciprocal compensation payments for Internet-bound traffic (because that traffic is no longer deemed local) removes the incentive for CLECs to use their regulatory status "solely (or predominately)" to funnel traffic to ISPs.[33]

[33] *Massachusetts ISP Compensation Order.*

3. Arbitrage

Q. PLEASE EXPLAIN HOW RECIPROCAL COMPENSATION FOR INTERNET-BOUND TRAFFIC COULD CREATE PERVERSE INCENTIVES TO ARBITRAGE THE SYSTEM AT THE EXPENSE OF BASIC EXCHANGE RATEPAYERS.

A. Arbitrage is frequently a response to a market distortion. As the DTE in Massachusetts and the FCC have clearly recognized, unintended arbitrage opportunities can easily emerge when competition in the local exchange market is distorted by basing inter-carrier compensation for Internet-bound traffic on the ILEC-CLEC local interconnection regime. When the compensation available to the CLEC for delivering Internet-bound traffic exceeds its actual cost of delivering that traffic, the CLEC will have a strong incentive to deliver as much ISP traffic as possible. The desire to maximize profits can bring forth some very inventive schemes that take advantage of this discrepancy but which distort market outcomes and reduce the efficiency of the telecommunications network. For example, the CLEC's profits would increase whenever a Qwest subscriber—or his computer—could be induced to call the ISP and remain on the line 24 hours a day.[34] Sensing this pure arbitrage profit opportunity, CLECs would also have a strong incentive—indeed, have as their *raison d'être*—to specialize in delivering

[34] Dedicated (private line) connections that bypass the public switched network are most efficient for customers desiring "always-on" or 24 hour connectivity. Despite this fact, such connectivity is sometimes offered in a manner that involves traffic origination through an ILEC's switch and termination through an ISP-serving CLEC's switch. This arrangement is clearly less interested in efficiency or the best use of valuable network resources than it is in generating the maximum possible revenue from reciprocal compensation.

Internet-bound traffic, to the exclusion of offering any other type of local exchange service. These "ISP-specializing" CLECs can—and do—form a three-way axis with a distortive ability and incentive to generate revenues from reciprocal compensation: (1) the CLECs themselves, (2) ISPs (served by those CLECs) which likely share those reciprocal compensation revenues—the spoils of this arrangement—in return for their loyalty and cooperation, and (3) ISP customers on the originating ILEC's network that generate the Internet-bound traffic.

Q. WHAT TYPES OF ARBITRAGE OCCUR IF THE INTER-CARRIER COMPENSATION RATE EXCEEDS THE LEC'S INCREMENTAL COST OF TRANSMITTING INTERNET-BOUND TRAFFIC?

A. In this circumstance, CLECs would have an incentive to create sham traffic solely for the purpose of collecting windfall inter-carrier compensation. That incentive distorts the marketing of its services towards customers who generate incoming traffic, but it also creates an incentive to carry as many minutes as possible to existing ISP customers. The CLEC might even offer to pay the ISP to connect to its network, in order to collect excessive inter-carrier compensation from the ILEC, which has no choice but to deliver its customers' calls to the CLEC—and pay the excessive compensation. Similarly, CLECs are encouraged to subsidize the ISPs' end user customers, encouraging them to maintain connections 24 hours a day, seven days a week. A case in North Carolina involving BellSouth and US LEC of North Carolina confirmed that perverse economic incentives can be created when the inter-carrier compensation rate exceed the CLEC's cost.[35] The North Carolina Commission found:

> US LEC deliberately created a usage imbalance between itself and BellSouth by terminating a greater amount of traffic originating on BellSouth's network than it would be terminating to BellSouth. In furtherance of its plan to create a traffic imbalance and thus large reciprocal compensation revenues for itself, US LEC, among other things, induced MCNC and Metacomm to originate connections on BellSouth's network and terminate them to US LEC telephone numbers by agreeing to pay them 40% of all reciprocal compensation BellSouth paid US LEC for minutes of use for which they were responsible.[36]

And,

> In the fall of 1997, Metacomm and MCNC established networks to generate reciprocal compensation for US LEC and commissions for themselves. They established connections by having routers connected to circuits purchased from BellSouth call routers connected to circuits provided by US LEC. They leased transmission facilities from BellSouth capable of originating up to 672 connections simultaneously. Pursuant to US LEC's instructions, Metacomm and MCNC programmed their routers to disconnect and immediately reconnect each connection every 23 hours and 59 minutes, so that US LEC's switches could create the records US LEC which [sic] needed to bill BellSouth for reciprocal compensation.[37]

This type of behavior also artificially discourages the deployment and use of new broadband technologies (e.g., cable or DSL connections) because such direct connections are not eligible for inter-carrier compensation.

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[35] *In the Matter of BellSouth Telecommunications Inc v. US LEC of North Carolina Inc,* Before the North Carolina Utilities Commission, Docket No P-561, SUB 10, March 31, 2000.

[36] *Id.*, at 7.

[37] *Id.* It should be noted that MCNC withdrew its participation in the reciprocal compensation arrangement after its management learned that the "unusual configuration and mix of equipment" making up the network was intended to generate revenue from connections without regard to actual traffic or content traversing the connections.

Q. WOULD THIS BE TRUE OF A CLEC WHICH, UNLIKE ISP-SPECIALIZING CLECs, IS A LARGE FACILITIES-BASED PROVIDER OF LOCAL EXCHANGE SERVICES?

A. Yes. All CLECs face these distorted incentives irrespective of the mix of traffic they actually serve. Whether a CLEC passes through a portion of the reciprocal compensation payments it receives to attract ISP customers is irrelevant, because competition among CLECs to serve ISPs will ensure that reciprocal compensation payments in excess of cost will be passed through to ISPs in the form of lower market prices for the network access they buy from CLECs.

Q. HAVE REGULATORS TAKEN EXPLICIT NOTE OF THE FACT THAT THESE ARBITRAGE OPPORTUNITIES ARISE BECAUSE COMPENSATION RATES ARE OUT OF LINE WITH TERMINATION COSTS?

A. Yes. Where the cost of terminating traffic to a particular type of customer differs greatly from the average, the FCC has recognized the possibility of arbitrage and has declined to use the ILEC's TELRIC of termination as a proxy for those of the CLEC:

> Using incumbent LEC's costs for termination of traffic as a proxy for paging providers' costs, when the LECs' costs are likely higher than paging providers' costs, might create uneconomic incentives for paging providers to generate traffic simply in order to receive termination compensation.[38]

[38] FCC, *In the Matter of Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, First Report and Order ("*Local Competition Order*"), released August 19, 1996, at ¶1093.

Instead, the FCC has required separate cost studies to justify a cost-based termination rate which the FCC explicitly expects would be lower than the wireline ILECs' TELRIC-based rate. Note that the paging case also involves one-way calling; like ISPs, paging companies do not originate traffic.

More recently, the FCC has acknowledged that:

> efficient rates for inter-carrier compensation for Internet-bound traffic are not likely to be based entirely on minute-of-use pricing structures. In particular, pure minute-of-use pricing structures are not likely to reflect accurately how costs are incurred for delivering Internet-bound traffic.[39]

This is clear recognition of the fact that TELRIC-based rates, such as those developed in Arizona, are fundamentally unsound for inter-carrier compensation for Internet-bound traffic. Echoing the FCC's sentiment, the Massachusetts DTE has stated flatly that:

> The revenues generated by reciprocal compensation for ... incoming traffic are most likely in excess of the cost of sending such traffic to ISPs. ... Not surprisingly, ISPs view themselves as beneficiaries of this "competition" and argue fervently in favor of maintaining reciprocal compensation for Internet-bound traffic. However, the benefits gained, through this regulatory distortion, by CLECs, ISPs, and their customers do not make society as a whole better off, because they come artificially at the expense of others.[40]

E. Conclusions About Inter-Carrier Compensation for Internet-Bound Traffic

Q. WHAT DO YOU CONCLUDE IN LIGHT OF THESE ACKNOWLEDGEMENTS?

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[39] *Internet Traffic Order*, ¶29.

[40] *Massachusetts ISP Compensation Order.* Emphasis added.

A. It is reasonable to expect that a fairer system of inter-carrier compensation may yet be more widely adopted for all forms of one-way traffic. The ILEC-IXC interconnection regime offers one such alternative. More importantly, under that alternative:

1. perverse incentives and unintended arbitrage opportunities are removed,
2. cost causation guides cost recovery (including the payment of access-like charges by ISPs to ILECs and CLECs that handle their traffic),
3. more efficient use is made of network resources,
4. inefficient entry for the sake of earning opportunistic arbitrage profits is prevented, and
5. true competition (undistorted by the gain from specializing in terminating one-way traffic) can be realized in the local exchange market.

Of course, this interconnection regime would call for access-like usage-based charges to be paid for Internet-bound traffic.

Q. HOW COULD THE PAYMENT OF ACCESS-LIKE CHARGES SOLVE THE PROBLEM OF INEFFICIENT SUBSIDIZATION?

A. In the ILEC-IXC regime, the ISP customer is held responsible for causing and, therefore, paying all of the origination, transport, and switching costs of an Internet call. Full cost recovery from the cost source would eliminate any possibility of inefficient subsidization.

Q. HOW DOES THE FCC'S ESP EXEMPTION FROM ACCESS CHARGES CHANGE THIS CONCLUSION?

A. The FCC's ESP exemption leaves the ISP the beneficiary of a subsidy funded partially by the ILEC and the CLEC that jointly supply access services to the ISP.

Because of that exemption, the ILEC and the CLEC would never actually be fully compensated for the costs they incur on Internet-bound calls. However, within this framework, that ILEC and CLEC could each still only be asked to contribute to the ISP access subsidy no more than the same proportion of their respective costs.

Q. PLEASE DESCRIBE THIS ALTERNATIVE COMPENSATION MECHANISM.

A. The ISP would still be held responsible for compensating the ILEC and the CLEC. Because of the access charge exemption, the second-best inter-carrier compensation mechanism would be for the ILEC and the CLEC to share the exchange access or PRI revenues received by the CLEC from the ISP that it serves. They would each share those revenues in the same proportions as their costs, although it is possible that neither would be fully compensated. This arrangement would be competitively-neutral, however, because the ILEC and the CLEC would both have to contribute to the subsidy rather than just the ILEC that originates the Internet-bound call. In this regime, the ISP would have no particular incentive to become a CLEC itself, nor would the competition among the ILEC and the CLEC to serve the ISP be distorted by incentives to seek compensation for delivering calls.

Q. IS BILL-AND-KEEP AN APPROPRIATE COMPENSATION MECHANISM FOR INTERNET-BOUND TRAFFIC?

A. It is the third-best alternative. Bill-and-keep amounts to payment of reciprocal compensation at a zero rate. It is, therefore, not a fully cost-causative form of compensation. However, it is also not necessarily as distortive as a reciprocal compensation at a positive rate, with the rate set on the basis of the ILEC's cost to terminate *local voice calls*. Bill-and-keep also requires the ILEC and the CLEC to participate in the subsidization of Internet access and the ISP. In fact, the subsidy burden is greater than under the second-best case in which revenues earned from the ISP are shared equitably by the ILEC and the CLEC.

Q. IN CONCLUSION, IS COST CAUSATION-BASED COMPENSATION THE ONLY FORM OF INTER-CARRIER COMPENSATION FOR INTERNET-BOUND CALLS THAT THE COMMISSION SHOULD CONSIDER?

A. Yes. From the economic standpoint, any method of inter-carrier compensation for Internet-bound calls should be based on cost causation. Ideally, access-like usage-based charges should be paid by the ISP to the ILEC and the CLEC that transport and switch Internet calls to it. However, because of the FCC's current ESP exemption, the next-best cost-causative form of compensation would be an equitable sharing (between the ILEC and the CLEC) of revenues earned by the CLEC from the lines it sells to the ISP. This form of revenue sharing may not be sufficient for the ILEC and CLEC that jointly provide access service to fully recover their costs, but the degree to which they under-recover those costs (or, equivalently, subsidize Internet service) would be in the same proportion as their respective costs and, hence, competitively-neutral. The third-best and reasonable interim form of compensation would be bill-and-keep or, in effect, exchange of Internet-bound traffic between the ILEC and the CLEC at no charge to each other.

In my opinion, because it is not based on cost causation, reciprocal compensation at a positive rate should not be an option at all.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION	)	
INTO QWEST CORPORATION'S	)	
COMPLIANCE WITH CERTAIN	)	DOCKET NO. T-00000A-00-0194
WHOLESALE PRICING REQUIREMENTS	)	
FOR UNBUNDLED NETWORK ELEMENTS	)	PHASE 2
AND RESALE DISCOUNTS	)	

EXHIBITS OF

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ON BEHALF OF

QWEST CORPORATION

March 15, 2001

n/e/r/a
Consulting Economists

INDEX OF EXHIBITS

EXHIBIT WET-1

WILLIAM E. TAYLOR: CURRICULUM VITAE

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Dr. Taylor received a B.A. magna cum laude in Economics from Harvard College, an M.A. in Statistics and a Ph.D. in Economics from the University of California at Berkeley. He has taught economics, statistics, and econometrics at Cornell and the Massachusetts Institute of Technology and was a post doctoral Research Fellow at the Center for Operations Research and Econometrics at the University of Louvain, Belgium.

At NERA, Dr. Taylor is a Senior Vice President, heads the Cambridge office and is Director of the Telecommunications Practice. He has worked primarily in the field of telecommunications economics on problems of state and federal regulatory reform, competition policy, terms and conditions for competitive parity in local competition, quantitative analysis of state and federal price cap and incentive regulation proposals, and antitrust problems in telecommunications markets. He has testified on telecommunications economics before numerous state regulatory authorities, the Federal Communications Commission, the Canadian Radio-television and Telecommunications Commission, federal and state congressional committees and courts. Recently, he was chosen by the Mexican Federal Telecommunications Commission and Telmex to arbitrate the renewal of the Telmex price cap plan in Mexico. Other recent work includes studies of the competitive effects of major mergers among telecommunications firms and analyses of vertical integration and interconnection of telecommunications networks. He has appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer.

He has published extensively in the areas of telecommunications policy related to access and in theoretical and applied econometrics. His articles have appeared in numerous telecommunications industry publications as well as *Econometrica*, the *American Economic Review*, the International *Economic Review*, the *Journal of Econometrics*, *Econometric Reviews*, the *Antitrust Law Journal*, *The Review of Industrial Organization*, and *The Encyclopedia of Statistical Sciences*. He has served as a referee for these journals (and others) and the National Science Foundation and has served as an Associate Editor of the *Journal of Econometrics*.

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY
Ph.D., Economics, 1974

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EMPLOYMENT

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC. (NERA)
1988- Senior Vice President, Office Head, Telecommunications Practice Director. Dr. Taylor has directed many studies applying economic and statistical reasoning to regulatory, antitrust and competitive issues in telecommunications markets. In the area of environmental regulation, he has studied statistical problems associated with measuring the level and rate of change of emissions.

BELL COMMUNICATIONS RESEARCH, INC. (Bellcore)
1983-1988 Division Manager, Economic Analysis, formerly Central Services Organization, formerly American Telephone and Telegraph Company. While at Bellcore, Dr. Taylor performed theoretical and quantitative research focusing on problems raised by the implementation of access charges. His work included design and implementation of demand response forecasting for interstate access demand, quantification of potential bypass liability, design of optimal nonlinear price schedules for access charges and theoretical and quantitative analysis of price cap regulation of access charges.

BELL TELEPHONE LABORATORIES
1975-1983 Member, Technical Staff, Economics Research Center. Performed basic research on theoretical and applied econometrics, focusing on small sample theory, panel data and simultaneous equations systems.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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1974-1975 Research Associate. Performed post-doctoral research on finite sample econometric theory and on cost function estimation.

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1972-1975 Assistant Professor, Department of Economics. (On leave 1974-1975.) Taught graduate and undergraduate courses on econometrics, microeconomic theory and principles.

MISCELLANEOUS

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1995- Board of Trustees, Treasurer, Episcopal Divinity School, Cambridge, Massachusetts.

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Arizona Corporation Commission (Docket Nos. T-03654A-00-0882,T-01051B-00-0882), January 8, 2001.
Florida Public Service Commission (Docket No. 000075-TP), filed January 10, 2001.
Colorado Public Utilities Commission (Docket No. 00B-601T), filed January 16, 2001.
Utah Public Service Commission (Docket No. 00-999-05), direct filed February 2, 2001, rebuttal filed March 9, 2001.

Contract Services

Superior Court Department of the Trial Court (Civil Action No. 95-6363F), affidavit, July 1996.
Connecticut Department of Public Utilities (Docket No. 99-03-17), June 18, 1999.

Performance Measurements

Georgia Public Service Commission (Docket No. 7892-U), June 27, 2000.

Miscellaneous

New Mexico Public Regulation Commission (Utility Case No. 3147), December 6, 1999.

New Mexico Public Regulation Commission (Utility Case No. 3008), May 19, 2000.

March, 2001

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	)	**DOCKET NO. T-00000A-00-0194** **AFFIDAVIT OF WILLIAM E. TAYLOR**
COMMONWEALTH OF MASSACHUSETTS	)	
COUNTY OF MIDDLESEX	)	

William E. Taylor, of lawful age being first duly sworn, depose and states:

1. My name is William E. Taylor. I am Senior Vice President of National Economic Research Associates, Inc. I have caused to be filed written testimony and exhibits in support of Qwest Corporation in Docket No. T-03654A-00-0882.

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

William E. Taylor

William E. Taylor

SUBSCRIBED AND SWORN to before me this 9th day of March, 2001.

Selina Smiley

Notary Public residing at
East Boston, Massachusetts

My Commission Expires: Sept 4, 2004

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO Qwest CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	**DOCKET NO. T-00000A-00-0194 Phase II**

DIRECT TESTIMONY OF

ROBERT F. KENNEDY

QWEST CORPORATION

March 15, 2001

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

This Direct Testimony proposes recurring and nonrecurring charges and describes certain products and services included within the categories of Local Interconnection Service, Collocation, CLEC-to-CLEC Connections, Unbundled Network Elements and Other Services. The recurring and nonrecurring charges discussed herein are included in the Direct Testimony of Qwest witness Maureen Arnold. Qwest recommends that the Arizona Corporation Commission (Commission) approves Qwest's proposed recurring and nonrecurring charges for the products included in this proceeding.

II. IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH QWEST CORPORATION.

A. My name is Robert F. Kennedy. My business address is 1314 Douglas-on-the-Mall, 6th Floor, Omaha, Nebraska 68102. My principal business responsibility is to testify in regulatory and legal proceedings concerning Qwest's wholesale services and products.

Q. PLEASE BRIEFLY REVIEW YOUR EDUCATIONAL BACKROUND.

A. I hold a Bachelor of Science degree in education from the University of Nebraska at Omaha. I have completed numerous technical courses concerning the installation and maintenance of telecommunications equipment and facilities.

Q. BRIEFLY OUTLINE YOUR EMPLOYMENT BACKGROUND.

A. I began my career in the telecommunications industry in 1972 with the former Northwestern Bell in Omaha, Nebraska. From 1972 to 1978, I held the positions of lineman and cable splicer. In 1978, I moved into a management position where I was an instructor and course developer for outside plant courses. In 1985, I joined the former U S WEST's Custom Pricing Organization where I developed the cost models used in pricing DS1, DS3, SHARP and SHNS products, among others. From April 1996 until April, 2000 I was U S WEST's lead negotiator for interconnection agreements with competitive local exchange providers (CLECs).

III. PURPOSE OF DIRECT TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. This Direct Testimony describes certain of Qwest's products and services, and the applicable recurring and nonrecurring charges for these products and services, which Qwest seeks to introduce in this proceeding. Specifically, I describe the following products and services and their associated charges:

Local Interconnection Service (LIS)

Collocation

CLEC to CLEC Connections

Certain UNEs including:

- Unbundled Loops
- Sub-Loop
- Unbundled Dedicated Interoffice Transport (UDIT) and Extended UDIT (EUDIT)
- Unbundled Dark Fiber (UDF)
- Interconnection Tie Pairs (ITP)
- Field Connection Point (FCP)

Other Services including:

- Enhanced Extended Loop (EEL)
- Access to Poles, Ducts and Rights of Way (ROW)
- Bona Fide Requests (BFR)

IV. LOCAL INTERCONNECTION SERVICE (LIS)

Q. PLEASE DESCRIBE QWEST'S LOCAL INTERCONNECTION SERVICE (LIS).

A. LIS is a terminating, trunk-side service provided between the point of interconnection (POI) of a CLEC's network and the Qwest network. LIS trunks are used to complete local calls between a CLEC's end user customers and Qwest's end user customers. Local calls begin and end within a local calling area that has been defined by the Commission. RFK Exhibit 1 provides an illustrative example of the LIS products.

A. ENTRANCE FACILITIES

Q. PLEASE DESCRIBE HOW AN ENTRANCE FACILITY IS USED TO INTERCONNECT QWEST'S NETWORK WITH A CLEC'S NETWORK.

A. Interconnection may be accomplished by leasing facilities from Qwest. These leased facilities are provisioned on DS1 or DS3 entrance facilities. An entrance facility extends from the Qwest serving wire center to the CLEC's switch location or point of interconnection (POI). The recurring and nonrecurring rate elements that apply include DS1 Entrance Facilities and DS3 Entrance Facilities.

Q. WHAT ARE THE LIMITATIONS ON THE USE OF ENTRANCE FACILITIES?

A. Entrance facilities may not extend beyond the area served by the Qwest serving wire center. Furthermore, entrance facilities may not be used for interconnection with unbundled network elements.

B. LOCAL INTERCONNECTION SERVICE EXPANDED INTERCONNECT CHANNEL TERMINATION (LIS EICT)

Q. WHAT IS LIS EICT?

A. LIS EICT provides an intraoffice connection between a CLEC's collocated equipment and Qwest's network. When collocation is used to facilitate interconnection, the EICT recurring and nonrecurring rate elements will apply for each DS1 and DS3.

Q. IS QWEST INTRODUCING OTHER LIS EICT-RELATED PRODUCTS AT THIS TIME?

A. Yes. Qwest is introducing Interconnection Tie Pairs (ITP) and Channel Regeneration. These are optional replacement products that are addressed in Section VII. A. and B. of this testimony.

C. DIRECT TRUNKED TRANSPORT (DTT)

Q. WHAT IS DIRECT TRUNKED TRANSPORT (DTT)?

A. DTT are facilities between serving wire centers and tandem or end office switches. DTT facilities are provided as dedicated DS1 and DS3 facilities.

Q. HOW DOES QWEST PROPOSE TO CHARGE FOR DTT?

A. Recurring fixed and recurring per mile charges will be applied to DTT facilities ordered by a CLEC. The mileage for DTT facilities is measured based upon the distance (air miles) between Qwest's serving wire center and the local/access tandem or end office using the following increments:

DS1/DS3 over 0 to 8 miles
DS1/DS3 over 8 to 25 miles
DS1/DS3 over 25 to 50 miles
DS1/DS3 over 50 miles

D. MULTIPLEXING

Q. PLEASE DESCRIBE MULTIPLEXING.

A. Multiplexing is the process of combining two or more communications channels into a single higher bandwidth circuit. Multiplexing is an optional service that a CLEC may order from Qwest when it does not perform its own multiplexing.

Q. HOW WILL QWEST CHARGE FOR MULTIPLEXING?

A. Recurring and nonrecurring rate elements will be applied for each DS3 to DS1 multiplexed arrangement.

E. TRUNK NONRECURRING CHARGES

Q. WHEN DOES QWEST PROPOSE THAT TRUNK NONRECURRING CHARGES SHOULD APPLY?

A. Nonrecurring installation charges may be assessed for the first and each additional trunk ordered by a CLEC on an Access Service Request (ASR). The charges will vary depending on whether the trunks will interface with DS1 or DS3 LIS facility. In addition to nonrecurring installation charges, nonrecurring rearrangement charges will apply when a CLEC requests the rearrangement of DS1 and DS3 facilities.

F. LOCAL TRAFFIC

Q. WHAT RATES ARE INCLUDED IN THE LOCAL TRAFFIC CATEGORY?

A. The following fixed and distance sensitive recurring charges apply to Local Traffic:

- End office call termination, per minute of use
- Tandem Switched Transport
  - Tandem Switching, per minute of use
  - Tandem Transmission, per minute of use
    - 0-8 miles
    - 8-25 miles
    - 25-50 miles
    - over 50 miles

Q. WHAT IS THE END OFFICE CALL TERMINATION RATE ELEMENT?

A. The end office call termination rate element is a per minute of use charge for the use of the terminating end office switch to complete a local call.

Q. WHAT IS THE TANDEM SWITCHING RATE ELEMENT?

A. The tandem switching rate element is a per minute of use charge for the use of a tandem switch in the event a call is routed through a local tandem switch for call completion.

Q. WHAT IS THE TANDEM TRANSMISSION RATE ELEMENT?

A. The tandem transmission rates include a fixed per minute of use charge and a recurring per mile charge for the transmission of traffic from the tandem switch to the terminating end office switch for call completion.

G. MISCELLANEOUS CHARGES

Q. WHAT MISCELLANEOUS CHARGES DOES QWEST SEEK TO INTRODUCE?

A. Qwest seeks to introduce the following Miscellaneous Charges:

- Expedite Charge (LIS Trunks) - Arizona specific terms and conditions, which are found in the applicable Access Service tariff, are applied to LIS nonrecurring charges to calculate expedite charges.

- Cancellation Charge (LIS Trunks) - Arizona specific terms and conditions, which are found in the applicable Access Service tariff, are applied to LIS nonrecurring to calculate cancellation charges.

- Construction Charges - An ICB charge applies for the construction of network capacity, facilities or space for access to or use of unbundled loops, ancillary services or finished services.

H. IntraLATA Toll Traffic

Q. WHEN DOES QWEST PROPOSE THAT CHARGES SHOULD APPLY FOR INTRALATA TOLL TRAFFIC?

A. The applicable Switched Access tariff charge should apply when a CLEC's IntraLATA Toll Traffic i.e. exchange access traffic, is routed to an access tandem or directly to an end office.

I. Transit Traffic

Q. WHAT IS TRANSIT TRAFFIC?

A. Transit Traffic consists of Local Transit traffic, IntraLATA Toll traffic, Jointly Provided Switched Access traffic, and Category 11 Mechanized Record traffic. Transit traffic, when used in association with LIS, is local traffic that neither originates nor terminates on Qwest's network. This includes traffic transmitted between one CLEC and another CLEC, or traffic that is transmitted between a CLEC and an ILEC, IXC or wireless carrier other than QWEST.

Q. CAN LIS BE USED TO PROVIDE TRANSIT TRAFFIC?

A. Yes. LIS enables the completion of local calls through the local tandem that originate and terminate on non-QWEST switches.

Q. WHAT CHARGES DOES QWEST PROPOSE FOR TRANSIT TRAFFIC?

A. The following charges should apply to Transit Traffic:

- Local Transit -The same charges apply to Transit Traffic as those that apply to Tandem Switching and Tandem Transmission addressed above.
- Tandem transmission is calculated using an assumed 9 miles. This result is added to the Tandem Switching rate.
- IntraLATA Toll - A charge consisting of the applicable Qwest Switched Access tandem switching and tandem transmission tariff rates.
- Jointly Provided Switched Access - A charge consisting of the applicable Switched Access rates based on the Multiple Exchange Carrier Access Billing (MECAB) guidelines and the respective FCC and state access tariffs.
- Category 11 Mechanized Record Charge, per record - A charge to recover the cost for providing a CLEC with the information necessary for the CLEC to bill the originating

carrier for transit when technically feasible. The charge applies to each record created and transmitted to the CLEC. Qwest makes the Category 11 Mechanized Record available as an optional offering because the information contained on the record can also be provided by the carrier who originates the call.

V. COLLOCATION

A. GENERAL

Q. PLEASE DESCRIBE COLLOCATION.

A. Collocation allows for the placement of telecommunications equipment within Qwest's premises for the purpose of accessing UNEs and/or terminating local traffic. The equipment can either be owned by the CLEC or, in the case of a virtual collocation, the equipment may be leased back to Qwest.

Q. WHICH RATE ELEMENTS APPLY TO QWEST'S COLLOCATION SERVICES?

A. Both recurring and nonrecurring rate elements apply to Qwest's collocation services. The rate elements are determined based upon the scope of the work to be performed as determined through an evaluation of the information provided by the CLEC on Qwest's collocation application form.

The rate elements for collocation are categorized as follows:

1) All Collocation;

(2) Cageless Physical Collocation;

(3) Caged Physical Collocation; and

(4) Virtual Collocation.

B. ALL COLLOCATION

Q. PLEASE DESCRIBE THE RATE ELEMENTS INCLUDED IN THE ALL COLLOCATION CATEGORY.

A. Rate elements included in the All Collocation category are generic in nature and may apply to one or more types of collocation. The rate elements include: (1) Collocation Terminations, (2) Collocation Entrance Facility, (3) Cable Splicing, (4) –48 Volt DC Power Usage, (5) AC Power Feed (6) Inspector Labor, (7) Security and (8) Central Office Clock Synchronization:

(1) **Collocation Terminations:** A collocation termination is located between the CLEC's collocation space and the interconnection distribution frame (ICDF). Recurring and nonrecurring charges apply for cable placement, cable block placement, and blocks required by the CLEC.

Listed below are the Collocation Termination rate elements presented:

DSO terminations:

DS0 Cable Placement, per 100 pair block or per termination

DSO Cable, per 100 pair block or per termination

DSO Block Placement, per 100 pair block or per termination

DSO Block, per 100 pair termination or per termination

DS1 terminations:

DS1 Cable Placement, per 28 DS1 or per termination

DS1 Cable, Per 28 DS1 or per termination

DS1 Panel Placement, per 28 DS1 or per termination

DS1Panel, per 28 DS1 or per termination

DS3 terminations:

DS3 Cable Placement, per termination

DS3 Cable, per termination

DS3 Panel/Connector Placement, per termination

DS3Panel/Connector, per termination

(2) **Collocation Entrance Facility Charge:** Qwest offers three Fiber Collocation Entrance Facility options. The first option is a Standard Fiber Entrance Facility, the second option is a Cross- Connect Fiber Entrance Facility and the third option is Express Fiber Entrance Facility. These options apply to

Caged Physical Collocation, Cageless Physical Collocation and Virtual Collocation.

(a) **Standard Fiber Entrance Facility:** The standard fiber entrance facility provides fiber connectivity between a CLEC's fiber facilities delivered to the Collocation Point Of Interconnection (C-POI) and the CLEC's collocation space. A fiber interconnection cable is placed between a CLEC's collocation space and the Feeder Distribution Panel (FDP).

(b) **Cross Connect Fiber Entrance Facility:** The cross-connect fiber entrance facility provides fiber connectivity between a CLEC's fiber facilities delivered to a C-POI and multiple locations within the Qwest wire center. The CLEC's fiber cable is spliced into a Qwest provided shared fiber entrance cable. The fiber cable terminates in an FDP. Fiber interconnection cables connect the second FDP and equipment locations in the wire center. This option has the capability to serve multiple locations or pieces of equipment within the office. This option provides maximum flexibility in distributing fibers within the wire center and readily supports

Virtual and Cageless Physical Collocation and multiple CLEC locations in the office.

(c) **Express Fiber Entrance Facility:** Qwest will place a CLEC provided fiber cable from the C-POI directly to the CLEC's collocation space. This option will not be available if there is less than one full sized conduit for emergency restoration and 2 innerducts -one for emergency restoral and one for a shared entrance cable.

(3) **Cable Splicing Charge:** The Cable Splicing charge is intended to recover the labor and equipment necessary to perform a subsequent splice or splices to a CLEC-provided fiber optic cable. The Cable Splicing charge consists of two elements: one for setup and one for each fiber spliced.

(4) **-48 Volt Power Usage:** Recovers the cost of purchasing power from the electric company and the cost of the power plant and maintenance to provide power to the CLEC's equipment. The recurring charge is applied on a per month per amp basis.

(5) **AC Power Feed:** The AC Power feed is optional. The AC Power feed recovers the cost of Qwest providing the engineering and installation of wire, conduit and support, breakers and miscellaneous electrical equipment necessary

requirements when ordering the clock signals. Central office synchronization is required for collocation involving digital services or connections. Synchronization may be required for analog services. Central Office Clock Synchronization is available where Qwest wire centers are equipped with Building Integrated Timing Supply (BITS). A monthly charge is applied on a per port basis.

(9) **Space Availability Report:** Upon request from a CLEC, Qwest will prepare a central office Space Availability Report. The report will include the number of collocations within the central office, the number of equipment bay spaces available for collocation, any measures that Qwest has underway to make additional collocation space available, and finally, any modifications that Qwest may have made in the use of space since the last report was issued. A nonrecurring charge will apply for each central office Space Availability Report ordered by the CLEC.

C. CAGELESS PHYSICAL COLLOCATION

Q. WHAT IS CAGELESS PHYSICAL COLLOCATION?

A. Cageless Physical Collocation permits the CLEC to locate its equipment in single frame bay increments within a non-caged area of Qwest's premises. The CLEC is responsible for the procurement, installation and on-going maintenance of its equipment, as well as those cross-connections required within the CLEC's collocation space.

Q. PLEASE DESCRIBE THE RATE ELEMENTS THAT ARE ASSOCIATED WITH CAGELESS PHYSICAL COLLOCATION.

A. There are three categories of rate elements associated with Cageless Physical Collocation. The first is Quote Preparation Fee, the next is Space Construction and the third is Floor Space Lease. Each of these rate elements is described below:

(1) **Quote Preparation Fee (QPF):** QPF is a non-refundable, nonrecurring charge for the work required to verify space, power, cable terminations, review design requested, and develop a price quote for the total costs to the CLEC for its Cageless Collocation request.

(2) **Space Construction:** These charges recover the cost of engineering the job, site preparation, providing a single DC power feed, overhead structures to support cable racking and CLEC equipment, cable racking, additional lighting, and the supporting environmental requirements i.e. heating, ventilation and air conditioning.

Recurring and nonrecurring charges apply for cageless collocation space construction. The physical cageless collocation space construction charge includes the provisioning of one 40-amp DC power feed. If the CLEC requests a cageless collocation with a power feed of 20, 30, or 60 amperes per bay, an adjustment to space construction charges are applied for the amps requested. If the CLEC orders an additional power cable, additional charges are applied. Cageless collocation is designed to provide two bays for the CLEC's equipment. If the CLEC requires additional bays, an incremental per bay nonrecurring charge is applied to recover the prorated costs of the supporting structure, cable racking, lighting, and grounding facilities.

(3) **Floor Lease Space:** This charge is intended to recover the cost of the space and its use including: one 110 AC, 15 amp electrical outlet, preventative maintenance and repair of climate controls, filters, fire and life systems and alarms, mechanical systems, and HVAC, bi-weekly housekeeping service and general repair and maintenance. A recurring monthly charge applies on a per square foot basis.

D. CAGED PHYSICAL COLLOCATION

Q. WHAT IS CAGED PHYSICAL COLLOCATION?

A. Caged Physical Collocation permits the CLEC to lease caged floor space within Qwest's premises for the placement of the CLEC's equipment. The CLEC may access Qwest provided UNEs or it may access Qwest's finished services through its equipment.

Q. PLEASE DESCRIBE THE RATE ELEMENTS THAT ARE SPECIFIC TO CAGED PHYSICAL COLLOCATION.

A. There are four rate elements that are specific to Caged Physical Collocation. The first is Quote Preparation Fee, the next is Space Construction, the third is Floor Space Lease and the fourth is Grounding. Each of these rate elements is described below:

(1) **Quote Preparation Fee (QPF):** QPF is a non-refundable, nonrecurring charge for the work required to verify space, power, cable terminations, review design requested, and develop a price quote for the total costs to the CLEC for its caged collocation request.

(2) **Space Construction:** This charge recovers the cost of engineering the job, cage construction, providing a single DC power feed, overhead structures to support cable racking and CLEC equipment, additional lighting, and the supporting environmental requirements i.e. heating, ventilation and air conditioning.

There are both recurring and nonrecurring charges for caged collocation arrangements. The physical caged collocation space construction charge includes the provisioning of one 60-amp DC power feed. If the CLEC requests a caged collocation with a power feed of 20, 30, 40, 100, 200, 300 or 400 amperes, an adjustment to the space construction charge is applied for the amps requested. If the CLEC orders an additional power cable additional charges apply. Consistent with the FCC's First

Interconnection Order, CLECs have the option to subcontract the construction of the caged enclosure to contractors approved by Qwest, in conformance with Qwest's standards.

(3) **Floor Lease Space:** This charge recovers the cost of the space and its use including: one 110 AC, 15 amp electrical outlet, preventative maintenance and repair of climate controls, filters, fire and life systems and alarms, mechanical systems, and HVAC, bi-weekly housekeeping service and general repair and maintenance. A recurring monthly charge applies on a per square foot basis.

(4) **Grounding:** The grounding rate element recovers the cost of extending the building DC ground from the grounding plane of the wire center to the CLEC's caged collocation space. There is a recurring and nonrecurring charge per size, per foot.

E. VIRTUAL COLLOCATION

Q. PLEASE DESCRIBE THE RATE ELEMENTS THAT ARE UNIQUE TO VIRTUAL COLLOCATION.

A. Following are the rate elements that are unique to virtual collocation.

Quote Preparation Fee (QPF): QPF is a non-refundable, nonrecurring charge for the work required to verify space, power, cable terminations, review design requested, and develop a price quote for the total costs to the CLEC for its Virtual Collocation request.

Engineering Labor: Engineering Labor recovers the cost of planning and engineering the installation, change or removal of the CLEC's equipment and associated supporting equipment such as power, cabling, cable racking, frame terminations, lighting, and entrance facility. Qwest charges CLECs per half-hour of engineering labor performed during regular business hours and a separate rate per half-hour for engineering performed outside of regular business hours.

Installation Labor: Installation Labor recovers the cost of the installation, change or removal of the CLEC's equipment and associated supporting equipment. Installation labor is assessed in half-hour increments for installation labor performed during regular business hours and at a separate rate per half-hour for installations performed outside of regular business hours.

Maintenance Labor: Maintenance labor recovers the cost for the labor necessary to repair of out of service and/or service affecting conditions and preventative maintenance of a CLEC's virtually collocated equipment. The CLEC is responsible for ordering maintenance spares. Qwest will perform maintenance and/or repair work upon receipt of the replacement maintenance spare and/or equipment from a CLEC.

Training Labor: Training Labor recovers the cost of training Qwest employees on the installation and maintenance of non-standard equipment provided by a CLEC under a virtual collocation arrangement. This charge does not apply if a CLEC selects equipment already in use by Qwest in the same metropolitan area. The training element covers the cost of training three Qwest employees, and includes the actual cost of the training course, and the employees' time. In the event a second CLEC selects the same equipment, the second CLEC is assessed a training fee equal to one-half the fee charged to the first CLEC. The first CLEC is refunded one-half the training fee.

Equipment Bay / per shelf: Recovers the cost of the equipment rack in which the CLEC's virtually collocated equipment and fuse panel is mounted. The cost of the equipment bay is recovered through a recurring rate per month, per equipment shelf.

Floor Space Lease: Required for virtual collocation only in the instance where the CLEC provides its own equipment bay. This rate element provides the monthly lease for the space occupied by the CLEC-provided equipment bay, including property taxes and base operating cost without -48 volt DC power. Includes convenience 110 AC, 15 amp electrical outlets provided in accordance with local codes and may not be used to power transmission equipment or -48 volt DC power generating equipment. Also includes maintenance for the leased space; provides for the preventative maintenance (climate controls, filters, fire and life systems and alarms, mechanical systems, standard HVAC); biweekly housekeeping services (sweeping, spot cleaning, trash removal) of Qwest premises areas surrounding the CLEC-provided equipment bay and general repair and maintenance. The Floor Space Lease includes required aisle space on each side of the CLEC-provided equipment bay.

Q. DO THE RATE ELEMENTS IDENTIFIED IN THE FOUR CATEGORIES OF COLLOCATION DESCRIBED ABOVE NECESSARILY APPLY TO ALL TYPES OF COLLOCATIONS THAT A CLEC MAY ORDER?

A. No. The rate elements may not be appropriate for use in developing pricing for certain types of collocation such as adjacent, remote or ICDF collocation.

Q. PLEASE DESCRIBE ADJACENT COLLOCATION.

A. When space is exhausted in a particular Qwest premises a CLEC may request Adjacent Collocation. When the request is determined to be technically feasible, Qwest will make space available in controlled environmental vaults or similar structures that are adjacent to Qwest's premises. Alternatively, Qwest will permit a CLEC to construct or otherwise procure such an adjacent structure on property owned or controlled by Qwest.

Q. PLEASE DESCRIBE REMOTE COLLOCATION.

A. With Remote Collocation, a CLEC may collocate equipment in, or adjacent to, Qwest's remote premises. Remote premises include controlled environmental vaults, controlled environmental huts, cabinets, pedestals and other remote terminals.

Q. HOW IS ADJACENT AND REMOTE COLLOCATION PRICED?

A. Due to the numerous variations and circumstances that may be involved, adjacent and remote collocation requests are priced on an Individual Case Basis (ICB).

Q. PLEASE DECRIBE INTERCONNECTION DISTRIBUTION FRAME COLLOCATION?

A. Interconnection Distribution Frame (ICDF) Collocation provides a location for CLECs to combine UNEs and ancillary services when they elect not to collocate equipment in Qwest's wire center.

Q. WHAT CHARGES APPLY TO ICDF COLLOCATION?

A. The charges that apply to ICDF Collocation are the non-recurring and recurring charges associated with the UNEs ordered by the CLEC and the cost of extending the UNEs to the demarcation point. This cost is recovered through the ITP charges addressed in the UNE section of this testimony. Additionally, a security charge applies to ICDF Collocation when ordered by a CLEC.

VI. CLEC-TO-CLEC CONNECTIONS

Q. PLEASE DESCRIBE CLEC-TO-CLEC CONNECTIONS.

A. CLEC-to-CLEC connections provide CLECs with the ability to connect with each other within the same Qwest wire center for the purpose of mutually exchanging traffic. A CLEC may also use the connections to connect multiple forms of its own collocations together within the same wire center.

Q. HOW IS A CLEC-TO-CLEC CONNECTION ACCOMPLISHED?

A. Qwest offers direct connection and cross-connection to CLECs that wish to order a CLEC-to-CLEC Connection.

Q. PLEASE DESCRIBE THE DIRECT CONNECTION.

A. When a direct connection is requested, a cable is placed between the collocations of each CLEC. The connections may be physical to physical, physical to virtual, or virtual to virtual collocations.

Q. PLEASE DESCRIBE THE RATE ELEMENTS THAT APPLY WHEN A CLEC ORDERS A DIRECT CONECTION.

A. A CLEC ordering the CLEC-to-CLEC direct connection will be charged:

(1) **Design Engineering and Installation Charge, No Cables**: This nonrecurring charge covers order processing, development of the price quote, and the hours to engineer and install cable racking.

(2) **Cable Racking (Per Foot)**: This recurring charge is a per foot, per month charge that recovers the cost of the racking used to support the cabling, but not the cabling itself. Prices also vary by the type of cabling supported i.e., DSO, DS1 and DS3);

(3) **Virtual Connections (Connections only; no cables)**: This nonrecurring charge covers the labor cost to connect a cable to a virtual collocation, but does not include the cost of the cable itself. If two virtual collocations are involved, two Virtual Connection charges apply. Prices vary by type i.e.. DSO per100 connections, DS1 per 28 connections, and DS3 per each connection.

(4) **Cable Hole**: This non-recurring charge is incurred per occurrence. It covers the cost of the labor and material that are required to open and close holes or slots between floors or through interior walls designed to be compartmentalized. These holes and slots are closed with approved firestop material that meets OSHA standards and Qwest policy.

Q. PLEASE DESCRIBE THE CHARGE THAT APPLIES WHEN A CLEC USES CLEC-TO-CLEC CROSS-CONNECTIONS TO CONNECT WITH ANOTHER CLEC'S COLLOCATION.

A. A one-time CLEC-to-CLEC Cross-Connection charge is the only rate that applies when a CLECs' uses Connecting Facility Assignments (CFA) residing on an Interconnection Distribution Frame (ICDF). Both CLECs must terminate at the same service rate level (i.e. DS1, DS3). Termination cables must be in place to the ICDFs. The CLEC may obtain the termination cables through the standard collocation ordering process.

VII. UNBUNDLED NETWORK ELEMENTS (UNES)

A. INTERCONNECTION TIE PAIRS (ITP)

Q. WHAT IS AN INTERCONNECTION TIE PAIR (ITP)?

A. An interconnection tie pair (ITP) is a connection between UNEs and a demarcation point at an ICDF.

Q. WHAT RATE ELEMENTS ARE BEING PRESENTED FOR THE ITP?

A. Recurring charges apply for DSO, DS1, and DS3 connections.

B. CHANNEL REGENERATION

Q. WHAT IS CHANNEL REGENERATION?

A. Channel Regeneration is an optional feature available to CLECs with DS1 and DS3 loops. The channel regenerator regenerates the DS1 and DS3 signals to overcome signal losses that are caused by the gauge of the copper cable and the length of the facility within a Qwest wire center.

Q. WHAT CHANNEL REGENERATION RATES ARE BEING PROPOSED?

A. Recurring and nonrecurring rates for both DS1 and DS3 regeneration are being proposed.

C. UNBUNDLED LOCAL LOOPS

Q. PLEASE DESCRIBE QWEST'S UNBUNDLED LOCAL LOOP PRODUCT.

A. Qwest's Unbundled Local Loop product establishes a transmission path between a wire center main distribution frame, or equivalent, up to and including, Qwest's Network Interface Device (NID) and/or demarcation point at the end user location. Unbundled Local Loops are available in three product categories: (i) 2-Wire and 4-Wire Analog, (ii) 2-Wire and 4-Wire Non-Loaded and (iii) Digital Capable.

Q. WHICH RECURRING RATES APPLY TO 2-WIRE AND 4-WIRE VOICE GRADE AND 2-WIRE AND 4-WIRE NON-LOADED ANALOG LOOPS?

A. The recurring rates that apply include those for 2-Wire and 4-Wire Voice Grade and 2-Wire and 4-Wire Non-loaded Analog Loops within Zones 1, 2 and 3.

Q. DOES THIS TESTIMONY ADDRESS OTHER TYPES OF LOOPS AND LOOP CHARGES?

A. Yes. This testimony addresses digital capable loops and their associated recurring and nonrecurring charges.

Q. PLEASE DESCRIBE THE DS0 LEVEL DIGITAL CAPABLE LOOPS.

A. The DSO level loop includes a Basic Rate ISDN Capable Loop, Digital Subscriber Loop (xDSL-I) and an Asymmetric Digital Subscriber Loop (ADSL).

Q. WHAT CHARGES APPLY FOR DSO LEVEL DIGITAL CAPABLE LOOPS ORDERED BY A CLEC?

A. Recurring charges apply for each of the DSO level digital capable loops identified above. Recurring charges apply for 2-wire unbundled loops within zones 1,2 and 3. Likewise, recurring charges apply for 4-wire unbundled loops within zones 1,2 and 3.

Q. WHAT OTHER CHARGES MAY APPLY TO LOOPS ORDERED BY THE CLEC?

A. An additional nonrecurring charge may apply to loops when conditioning of those loops is requested by the CLEC. The nonrecurring charge of Conditioning (Cable Unloading/Bridge Tap Removal) would apply in this instance.

Q. PLEASE DESCRIBE THE DS1 CABLE LOCAL LOOP.

A. The DS1 Capable Loop is a transmission path between a wire center network interface at a DS1 panel or equivalent in a Qwest serving wire center and the network interface at the end user location. The DS1 Capable Loop is capable of transporting bi-directional DS1 signals with a nominal transmission rate of 1.544 Mbit/s.

Q. DOES A RECURRING CHARGE APPLY TO THE DS1 CAPABLE LOOP?

A. Yes. A recurring charge applies to each DS1 Capable Loop ordered within Zone 1, 2 and 3.

Q. PLEASE DESCRIBE THE DS3 CABLE LOCAL LOOP.

A. The DS3 Capable Loop is a transmission path between a Qwest central office network interface and an equivalent demarcation point at an end user location. The DS3 Capable Loop is capable of transporting bi-directional DS3 signals with a nominal transmission rate of 44.736 Mbit/s.

Q. DOES A RECURRING CHARGE APPLY TO THE DS3 CAPABLE LOOP?

A. Yes. A recurring charge applies to each DS3 Capable Loop ordered within Zone 1, 2 and 3.

Q. WHAT NONRECURRING INSTALLATION CHARGES ASSOCIATED WITH UNBUNDLED LOOPS ARE ADDRESSED IN YOUR TESTIMONY?

A. The nonrecurring charges addressed in my testimony include:

- DSO – Basic Installation, Basic Installation with Performance Testing, Coordinated Installation with Cooperative Testing, and Coordinated Installation without Cooperative Testing and Basic Installation with Cooperative Testing.
- DS1 – Basic Installation, Basic Installation with Performance Testing, Coordinated Installation with Cooperative Testing and Coordinated Installation without Cooperative Testing and Basic Installation with Cooperative Testing.
- DS3 – Basic Installation, Basic Installation with Performance Testing, Coordinated Installation with Cooperative Testing and Coordinated Installation without Cooperative Testing and Basic Installation with Cooperative Testing.

Q. PLEASE DESCRIBE BASIC INSTALLATION.

A. Basic Installation may be ordered for existing DSO, DS1 and DS3 service. With Basic Installation, Qwest disconnects the loop from its current termination and delivers it via ITPs to the point of demarcation. A Basic Installation charge applies for each loop installed.

Q. PLEASE DESCRIBE BASIC INSTALLATION WITH PERFORMANCE TESTING.

A. Basic Installation with Performance Testing is the minimum level of installation required for new DSO, DS1 and DS3 service. Qwest will complete the circuit wiring and perform the required performance tests as described in Qwest's Technical Publication 77384 to ensure that the new circuit meets the required parameter limits. A Basic Installation with Performance Testing charge applies to each loop installed.

Q. PLEASE DESCRIBE BASIC INSTALLATION WITH COOPERATIVE TESTING.

A. Basic Installation with Cooperative Testing may be ordered for new service i.e. service that is not currently in place, or existing service. This service may be ordered by the CLEC when an end user changes from Qwest-provided service to CLEC-provided service, or when an end user changes from one CLEC-provided service to another CLEC-provided service. With Basic Installation with Cooperative Testing, the Qwest central office technician lifts the loop from its termination and lays it on the new termination that connects to the CLEC collocation equipment. A Qwest installation technician then completes the required performance tests. Finally, the CLEC performs acceptance testing. A Basic Installation with Cooperative Testing charge applies to each loop so installed.

Q. PLEASE DESCRIBE COORDINATED INSTALLATION WITH COOPERATIVE TESTING.

A. Coordinated Installation with Cooperative Testing may be ordered for new or existing DSO, DS1 and DS3 service. When an existing Qwest end-user, or a CLEC end-user, changes to another CLEC that orders this service, the coordinated installation will include cooperative testing and a technician dispatch. At the appointed time, Qwest will disconnect the loop from its current termination and deliver it to the point of demarcation in coordination with the CLEC. Qwest will complete the required performance tests and perform other testing as requested by the CLEC. A Coordinated Installation with Cooperative Testing charge applies to each loop so installed.

Q. PLEASE DESCRIBE THE COORDINATED INSTALLATION WITHOUT COOPERATIVE TESTING.

A. When an existing Qwest end-user or a CLEC end-user changes to another CLEC using this option, Qwest will disconnect the loop and deliver it to the requesting CLEC via an ITP to the demarcation point. This option offers the CLEC the ability to coordinate the conversion activity, thus allowing the CLEC's end-user the ability to minimize any service interruption. No testing is performed. At the appointed time, Qwest will disconnect the loop from its current termination and deliver it via an ITP to the point of demarcation. Coordinated Installation Without Cooperative Testing charges apply to each loop so installed.

D. SUB-LOOP UNBUNDLING

Q. WHAT IS A SUB-LOOP?

A. A Sub-loop is defined as any portion of the loop that it is technically feasible to access in Qwest accessible terminals located throughout the outside plant. The Sub-Loop elements addressed in this testimony include a 2-Wire Distribution Loop; a 2-Wire Non-Loaded Distribution Loop; Intrabuilding Cable-per pair; and a DS1 Capable Feeder Loop.

Q. PLEASE IDENTIFY THE CHARGES APPLICABLE TO THE 2-WIRE AND 4-WIRE ANALOG DISTRIBUTION LOOPS AND THE 2-WIRE AND 4-WIRE ANALOG/NON LOADED DISTRIBUTION LOOPS.

A. A recurring charge applies to each 2-Wire and 4-Wire Analog Distribution Loop located within Zones 1, 2 and 3. A recurring charge applies to each 2-Wire and 4-Wire Analog/Non Loaded Distribution Loop located within zones 1, 2 and 3. Basic Installation nonrecurring charges apply for the first and each additional 2-Wire and 4-Wire Analog and 2-Wire and 4-Wire Analog/Nonloaded Loop.

Q. PLEASE DESCRIBE THE INTRABUILDING CABLE LOOP PRODUCT.

A. When the CLEC places outside plant to a building and wishes to access the Qwest owned riser cable or inside wire through a building terminal it must order an Intrabuilding Cable Loop. The CLEC, or building owner, will place a common terminal or cross-connect facility near the existing Qwest terminal. Qwest will connect to the Qwest terminal providing connection to the riser/inside wire.

Q. WHAT CHARGE APPLIES WHEN AN INTRABUILDING CABLE LOOP IS ORDERED BY THE CLEC?

A. A monthly recurring charge applies per Intrabuilding Cable Loop pair ordered.

Q. WHAT CHARGES APPLY TO THE FIRST AND EACH ADDITIONAL DS1 CAPABLE FEEDER LOOP?

A. Recurring charges apply to DS1 Capable Feeder Loops in zones 1, 2 and 3. A separate nonrecurring charge applies to the first and each additional DS1 Feeder Loop installed.

E. FIELD CONNECTION POINT (FCP)

Q. WHAT IS A FIELD CONNECTION POINT (FCP)?

A. The FCP permits a CLEC to interconnect with the Qwest network outside of the central office location where it is technically feasible to do so. For example, the FCP allows the CLEC to access an unbundled Sub-Loop at a Feeder Distribution Interface (FDI). The FCP must be in place prior to Qwest processing the CLEC's request for an unbundled Sub-Loop.

Q. WHAT TYPES OF CHARGES ARE PROPOSED FOR FIELD CONNECTION POINT (FCP)?

A. Two nonrecurring charges are proposed for FCP. The first nonrecurring charge is the Feasibility and Quote Preparation charge. The second charge is an ICB Construction Fee.

F. NETWORK INTERFACED DEVICE (NID)

Q. PLEASE DEFINE THE TERM NETWORK INTERFACE DEVICE (NID).

A. The NID provides an interface between Qwest's loop facility and the end user's inside wire and is considered part of the unbundled loop facility. The NID provides a protective ground connection, provides protection against lightening and other high voltage surges and is capable of terminating cables such as twisted pair cable.

Q. WHAT CHARGES APPLY TO THE NID?

A. A recurring and nonrecurring charge applies to the NID.

G. UNBUNDLED DEDICATED INTEROFFICE TRANSPORT (UDIT) AND EXTENDED UNBUNDLED DEDICATED INTEROFFICE TRANSPORT (EUDIT)

Q. PLEASE DEFINE THE TERM UNBUNDLED DEDICATED INTEROFFICE TRANSPORT (UDIT).

A. UDIT is a network element that provides a CLEC with a single transmission path between two Qwest wire centers in the same LATA. UDITs are available in DS0, DS1, DS3, OC-3, OC-12 bandwidths, where facilities are available.

Q. WHAT RECURRING CHARGES DOES QWEST PROPOSE FOR UDIT?

A. Qwest proposes “fixed” and ”distance sensitive” recurring charges for DS0, DS1, DS3 OC-3 and OC-12 UDIT.

Q. DOES QWEST PROPOSE NONRECURRING CHARGES FOR UDIT?

A. Yes. Qwest proposes nonrecurring charges for the installation of DSO, DS1, DS3, OC3 and OC12 UDITs.

Q. WILL QWEST MAKE UDITS AVAILABLE AT BANDWIDTHS HIGHER THAN OC-12?

A. Yes. Qwest will make UDITs available at bandwidths in excess of OC-12 and up to OC-192 as an ICB basis.

H. UDIT-RELATED PRODUCTS AND SERVICES

Q. IS QWEST INTRODUCING OTHER UDIT-RELATED PRODUCTS AND SERVICES IN THIS COST PROCEEDING?

A. Yes. Qwest is introducing EUDIT Interoffice Transport, UDIT Rearrangement, Low Side Channelization, and Multiplexing in this cost proceeding.

Q. PLEASE DEFINE THE TERM EUDIT.

A. EUDIT is a network element that provides a CLEC with a bandwidth specific transmission path between the Qwest Serving Wire Center and the CLEC's Wire Center, or an IXC's point of presence located within the same Qwest Serving Wire Center area. EUDIT is a bandwidth-specific interoffice transmission path. EUDIT is available in DS1, DS3, OC-3, OC-12 bandwidths where facilities are available.

Q. WHAT TYPE OF EQUIPMENT DOES QWEST PROVIDE AT THE CLEC'S WIRE CENTER OR IXC POP?

A. For DS1 EUDIT, Qwest may provide existing copper to the CLEC's Wire Center or an IXC POP. For DS3 or OCn, Qwest provides only an optical interface with no terminating transmission equipment.

Q. WHICH CHARGES ARE APPLICABLE TO THE EUDIT?

A. Qwest proposes both recurring and nonrecurring charges for DS1, DS3, OC3, and OC12 EUDITs.

Q. WILL QWEST MAKE EUDITS AVAILABLE AT BANDWIDTHS HIGHER THAN OC-12?

A. Yes. Qwest will make EUDITs available at bandwidths in excess of OC-12 and up to OC-192 as an ICB basis.

Q. PLEASE DESCRIBE UDIT REARRANGEMENTS.

A. A CLEC may request that UDIT terminations be moved or rearranged at the CLEC demarcation point. A CLEC may also request that UDIT options be changed. Rearrangements may be ordered by the CLEC for working UDITS in place at single and dual office locations.

Q. WHAT CHARGES APPLY TO UDIT REARRANGEMENTS?

A. Nonrecurring charges apply for rearrangements involving DS0 single offices, DS0 dual offices, high capacity single offices, and high capacity dual offices

Q. WHAT IS LOW SIDE CHANNELIZATION?

A. Low Side Channelization modifies the circuit with the basic performance requirements needed for the circuit to function. It may also provide various signaling parameters necessary to enhance the basic performance.

Q. WHAT CHARGES APPLY TO LOW SIDE CHANNELIZATION?

A. Qwest proposes a recurring charge for Low Side Channel Performance. Qwest also proposes a recurring and nonrecurring charge for Low Side Channel Performance with Multiplexing.

Q. WHAT IS A MULTIPLEXER?

A. A multiplexer is electronic equipment that allows two or more communications channels to travel over a single circuit. Multiplexing is the process of combining a number of channels into a single higher bandwidth circuit. As traffic is moved throughout the network on a UDIT, the UDIT is multiplexed as traffic is distributed to various locations.

Q. WHAT CHARGES DOES QWEST PROPOSE FOR MULTIPLEXING?

A. Qwest proposes recurring and nonrecurring charges for DS1 to DS0 and DS3 to DS1 multiplexing and UDIT M1-3 and M1-0 Multiplexing High-Side.

I. UNBUNDLED DARK FIBER (UDF)

Q. PLEASE DESCRIBE UNBUNDLED DARK FIBER (UDF).

A. UDF is a deployed unlit pair of fiber optic cables or strands that connect two points within Qwest's network.

Q. PLEASE SUMMARIZE THE UDF CHARGES THAT QWEST IS INTRODUCING IN THIS COST PROCEEDING.

A. Qwest is introducing charges for Initial Records Inquiry, Field Verification and Quote Preparation, UDF-Interoffice Facilities (IOF) charges, and UDF Loop charges.

Q. WHAT IS INITIAL RECORDS INQUIRY (IRI)?

A. The IRI rate element recovers the cost associated with the pre-order work effort conducted by Qwest to determine the availability of UDF. IRI is a one-time nonrecurring charge that applies for each route check requested by a CLEC. A simple IRI will be conducted to determine if UDF is available between two Qwest wire centers, or between a Qwest wire center and a Qwest customer premises. A complex/midspan splice structure point inquiry IRI will be conducted to determine if UDF is available between a Qwest wire center and an outside structure (CEV, hut, etc.) located along the loop fiber route. A nonrecurring charge for the simple IRI has been developed and is presented in this Direct Testimony. The nonrecurring charge for a complex/midspan splice structure point inquiry IRI will be ICB.

Q. PLEASE DESCRIBE FIELD VERIFICATION AND QUOTE PREPARATION (FVQP).

A. Field Verification and Quote Preparation is used to provide an estimate of the cost to furnish the CLEC with UDF access at locations other than a Qwest wire center or an end-user's premises. Qwest will prepare a quote of the work activities, timeframes, and costs associated with providing access to a FCP location. FVQP is a nonrecurring charge.

Q. PLEASE DESCRIBE THE UDF-INTEROFFICE FACILITY (IOF).

A. UDF-IOF is an unlit pair of fiber optic cable or strands that connect two points within Qwest's network.

Q. WHAT UDF-IOF RECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest Proposes the following UDF-IOF recurring charges:

(1) Termination, fixed, per pair

(2) Fiber Transport, per pair, per mile

(3) Cross-Connect, per pair

Q. WHAT UDF-IOF NONRECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest proposes the following UDF-IOF nonrecurring charges:

(1) Order Charge, per pair, per route, per order

(2) Each Additional, per pair, same route

Q. PLEASE DESCRIBE THE TERM UDF-LOOP.

A. UDF-Loop is an existing loop that extends between a Qwest wire center and a fiber distribution panel located at an appropriate outside plant structure, or an end-user customer's premises.

Q. WHICH UDF-LOOP RECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest proposes the following recurring charges for UDF-Loop:

(1) Termination at Wire Center, per pair

(2) Termination at Premises, per pair

(3) UDF-Loop Fiber, per pair

(4) UDF-Loop Fiber Cross-Connect, per pair

Q. WHAT UDF-LOOP NONRECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest propose the following UDF-Loop nonrecurring charges:

(1) Order Charge, per pair, per route, per order

(2) Each Additional, per pair, same route

(3) Fiber Cross-Connect, per pair

Q. PLEASE DESCRIBE THE TERM E-UDF.

A. E-UDF is an existing loop that extends between a Qwest wire center and a fiber distribution panel located at an appropriate outside plant structure, or an end-user customer's premises.

Q. WHICH E-UDF RECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest proposes the following recurring charges for E-UDF:

(1) Termination at Wire Center, per pair

(2) Termination at Premises, per pair

(3) E-UDF-Loop Fiber, per pair

(4) Fiber Cross-Connect, per pair

Q. WHICH E-UDF NONRECURRING CHARGES DOES QWEST PROPOSE?

A. Qwest propose the following E-UDF nonrecurring charges:

(1) Order Charge, per pair, per route, per order

(2) Each Additional, per pair, same route

(3) Fiber Cross-Connect, per pair

J. MISCELLANEOUS NONRECURRING CHARGES

Q. PLEASE GENERALLY DESCRIBE THE NATURE OF THE ACTIVITIES FOR WHICH MISCELLANEOUS NONRECURRING CHARGES WOULD APPLY.

A. Miscellaneous Nonrecurring Charges are intended to cover additional engineering, labor and testing when incurred by Qwest. Miscellaneous charges may be assessed when at the direction of a CLEC a work activity is requested that is not part of the nonrecurring charges normally associated with a product. A CLEC may also be charged a miscellaneous non recurring charge when a CLEC reports a trouble condition and through testing Qwest discovers the trouble in the network which the CLEC is responsible for.

Q. PLEASE PROVIDE A LIST OF THE MISCELLANEOUS NONRECURRING CHARGES?

A. Additional Engineering - Basic (Per 1/2 Hour)
Additional Engineering - Overtime (Per 1/2 Hour)
Additional Labor Installation-Overtime (Per 1/2 Hour)
Additional Labor Installation-Premium (Per 1/2 Hour)
Additional Labor Other-Basic (Per 1/2 Hour)
Additional Labor Other-Overtime (Per 1/2 Hour)
Additional Labor Other-Premium (Per 1/2 Hour)
Testing and Maintenance Basic (Per 1/2 Hour)
Testing and Maintenance Overtime (Per 1/2 Hour)
Testing and Maintenance Premium (Per 1/2 Hour)
Maintenance of Service-Basic (Per1/2 Hour)
Maintenance of Service-Overtime (Per1/2 Hour)
Maintenance of Service-Premium (Per1/2 Hour)
Additional Coop Acceptance Test-Basic (Per1/2 Hour)
Additional Coop Acceptance Test-Overtime (Per1/2 Hour)
Additional Coop Acceptance Test-Premium (Per1/2 Hour)
Nonscheduled Coop Test-Basic (Per 1/2 Hour)

Nonscheduled Coop Test-Overtime (Per 1/2 Hour)

Nonscheduled Coop Test-Premium (Per 1/2 Hour)

Nonscheduled Manual Test-Basic (Per 1/2 Hour)

Nonscheduled Manual Test-Overtime (Per 1/2 Hour)

Nonscheduled Manual Test-Premium (Per 1/2 Hour)

Cooperative Scheduled Test-LOSS (Per Month)

Coop Scheduled Test-C-Message Noise (Per Month)

Coop Scheduled Test-Balance (Per Month)

Coop Scheduled Test-Gain Slope (Per Month)

Coop Scheduled Test-C Notched Noise (Per Month)

Manual Scheduled Test – Loss

Manual Scheduled Test-C-Message Noise (Per Month)

Manual Scheduled Test-Balance (Per Month)

Manual Scheduled Test-Gain Slope (Per Month)

Manual Scheduled Test-C Notched Noise (Per Month)

Q. DOES QWEST PROPOSE OTHER MISCELLANEOUS ELEMENTS IN ADDITION TO THOSE ADDRESSED IN THIS PROCEEDING?

A. Yes. Qwest proposes to introduce Additional Dispatch Charge, Date Change and Design Change elements in this cost proceeding.

Q. PLEASE DESCRIBE WHEN A NONRECURRING CHARGE WOULD APPLY FOR ADDITIONAL DISPATCH.

A. A nonrecurring charge would apply when, at the request of the CLEC, a Qwest technician is dispatched an additional time to a CLEC designated location.

Q. PLEASE DESCRIBE WHEN A NONRECURRING CHARGE WOULD APPLY FOR DATE CHANGE.

A. A Date Change nonrecurring charge would apply when the CLEC changes a previously established due date for service. Such a change necessitates the issuance of a new service order.

Q. PLEASE DESCRIBE WHEN AN INDIVIDUAL NONRECURRING CHARGE WOULD APPLY FOR DESIGN CHANGE.

A. A nonrecurring charge would apply when a design change occurs that requires an engineer's review. Such design changes may include a change of end user premises, the addition or deletion of optional features or functions, or a change in the type of transport termination.

Q. HOW DOES QWEST PROPOSE TO CHARGE FOR EXPEDITES AND CANCELLATIONS?

A. Qwest proposes to charge for Expedites and Cancellations on an ICB basis.

VIII. OTHER SERVICES

A. ENHANCED EXTENDED LOOP (EEL)

Q. PLEASE DESCRIBE ENHANCED EXTENDED LOOP (EEL).

A. An Enhanced Extended Loop (EEL) is a means by which a CLEC may access an end user customer not located in the same Qwest wire center in which the CLEC is located. An EEL is a combination of a loop and dedicated interoffice transport facilities. The EEL may also include multiplexing or concentration capabilities.

Q. PLEASE IDENTIFY THE CHARGES THAT QWEST PROPOSES FOR EEL.

A. Qwest proposes charges for the following EEL and EEL-related elements: EEL Link, EEL Transport, Multiplexing, DS0 Channel Performance, and Concentration Capability. A description of each element and its associated rate elements follows:

(1) EEL Link: The EEL Link is the loop connection between the end user customer premises and the serving Wire Center. Nonrecurring rate elements specific to EEL- Link apply for the first and each additional DSO, DS1 and DS3 facility and for DS1 and DS3 Transport Multiplexing

(2) EEL Transport: EEL Transport consists of the dedicated interoffice facilities between Qwest Wire Centers. Qwest proposes to use the UDIT nonrecurring DSO, DS1 and DS3 rates for EEL transport.

(3) EEL Multiplexing: EEL Multiplexing is offered in DS3 to DS1, DS1 to DS0 and DS1 and DS3 Transport Multiplexing configurations. Recurring and nonrecurring charges apply for DS3 to DS1 and DS1 to DS0 configurations. Nonrecurring charges apply to DS1 and DS3 Transport Multiplexing. All other multiplexing arrangements will be ICB. EEL Multiplexing is ordered with EEL Transport.

(4) DSO Channel Performance: DS0 Low Side Channelization and DS1/DS0 MUX Low Side Channelization are the two rate elements being introduced for DSO Channel Performance. Recurring charges apply to both types of channelization. A nonrecurring charge for DS1/DS0 MUX, Low Side Channelization is also proposed.

(5) Concentration Capability: A recurring ICB rate will apply for space preparation and space lease, equipment installation, cabling and associated terminations and structure installation, personnel training, if required, and delivery of required power.

Q. WHAT RECURRING RATE ELEMENTS APPLY TO THE EEL LINK DESCRIBED ABOVE?

A. The EEL Link recurring rate elements will depend upon the configuration requested by the CLEC. The recurring rates will therefore either be those applicable to the unbundled loop or EUDIT offered by Qwest.

Q. HOW DOES QWEST PROVIDE EELS?

A. Qwest provides EELs in two forms: EEL-Conversion (EEL-C) and EEL-Provision (EEL-P). EEL-C is the conversion of an existing private line/special access service to a combination of loop and transport UNEs. EEL-P is a new installation of loop and dedicated interoffice transport used by the CLEC for connecting an end user customer to the CLEC's switch.

Q. WHAT NONRECURRING CHARGES APPLY TO EEL-C

A. A nonrecurring charge applies for converting an existing service to EEL.

B. Access to Poles, Ducts, Conduits and Rights of Way (ROW)

Q WHICH ELEMENTS WITHIN THE CATEGORY OF POLES, DUCTS, CONDUITS AND RIGHTS OF WAY (ROW) IS QWEST INTRODUCING IN THIS COST DOCKET?

A. Qwest proposes the following nonrecurring charge elements:

(1)Pole Inquiry Fee- per mile
(2) Innerduct Inquiry Fee – per mile
(3)ROW Inquiry Fee
(4)ROW Documentation Fee
(5) Field Verification Fee per pole
(6) Field Verification Fee, per manhole
(7)Planner Verification, per manhole
(8) Manhole Verification Inspector, per manhole
(9) Manhole Make-Ready Inspector, per manhole.

Qwest also proposes the recurring price elements of Pole Attachment Fee and Innerduct Occupancy Fee.

Q. PLEASE DESCRIBE THE ACTIVITIES ASSOCIATED THE POLE AND INNERDUCT INQUIRY FEES.

A. The Pole Inquiry Fee and the Innerduct Inquiry Fee are a non-refundable pre-paid charges used to recover the costs associated with performing an internal record review to determine if a requested route and/or facility is available for lease.

Q. WHAT IS THE ROW INQUIRY FEE?

A. The ROW Inquiry Fee recovers the cost to research and provide a CLEC with copies of publicly recorded easements and a matrix of private easements that the CLEC's route will pass through.

Q. WHAT IS INCLUDED IN THE ROW DOCUMENTATION FEE?

A. The ROW Documentation Fee recovers the cost of research and preparation of documents associated with private easements, including the preparation of quit claim deeds as required.

Q. WHICH ACTIVITIES ARE ASSOCIATED WITH FIELD VERIFICATION?

A. The Field Verification Fees are non-refundable pre-paid charges that recovers the estimated actual costs for a field survey verification required for a route. The estimated pre-paid fees are billed in advance. Separate Field Verification Fees apply for poles and manholes.

Q. WHAT IS INCLUDED IN THE PLANNER VERIFICATION FEE?

A. The Planner Verification Fee is a pre-paid charge that recovers the cost for Qwest's tactical planner to review records and prepare a final field inspection report of availability.

Q. PLEASE DESCRIBE THE MANHOLE VERIFICATION CHARGE.

A. The Manhole Verification, Inspector per manhole charge will apply when a CLEC performs the field verification step of an innerduct request, This charge recovers the cost for a Qwest inspector to ensure that manholes are opened and sealed properly and that work safety standards are followed by the CLEC's workers.

Q. WHAT IS THE PURPOSE OF THEMANHOLE MAKE-READY FEE?

A. The Manhole Make-Ready Inspector, per manhole fee recovers the cost for a Qwest inspector to be present during the placement of innerduct by a CLEC. The inspector will ensure that manholes are opened and sealed properly, that the innerduct materials used by the CLEC's workers meet the appropriate standards and that work safety standards are followed.

Q. WHAT IS COVERED BY THE POLE ATTACHMENT FEE?

A. The Pole Attachment Fee is recovered from the CLEC for the occupancy of pole space. The fee is charged per foot, per year.

Q. WHAT IS THE INNERDUCT OCCUPANCY FEE?

A. The Innerduct Occupancy Fee is a pre-paid fee that is recovered from the CLEC for, occupancy of innerduct space. The fee is charged per foot, per year.

C. BONA FIDE REQUESTS

Q. PLEASE DESCRIBE A BONA FIDE REQUEST (BFR) AND THE ASSOCIATED NONRECURRING CHARGE.

A. A request by a CLEC for interconnection or access to a UNE or ancillary service that Qwest does not make readily available will be treated as a Bona Fide Request (BFR). Qwest will use the BFR process to determine the terms and timetable for providing the requested interconnection or access to UNEs or ancillary services. Qwest is proposing a nonrecurring nonrefundable Processing Fee for the BFR process.

IX. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does. Thank you.

BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

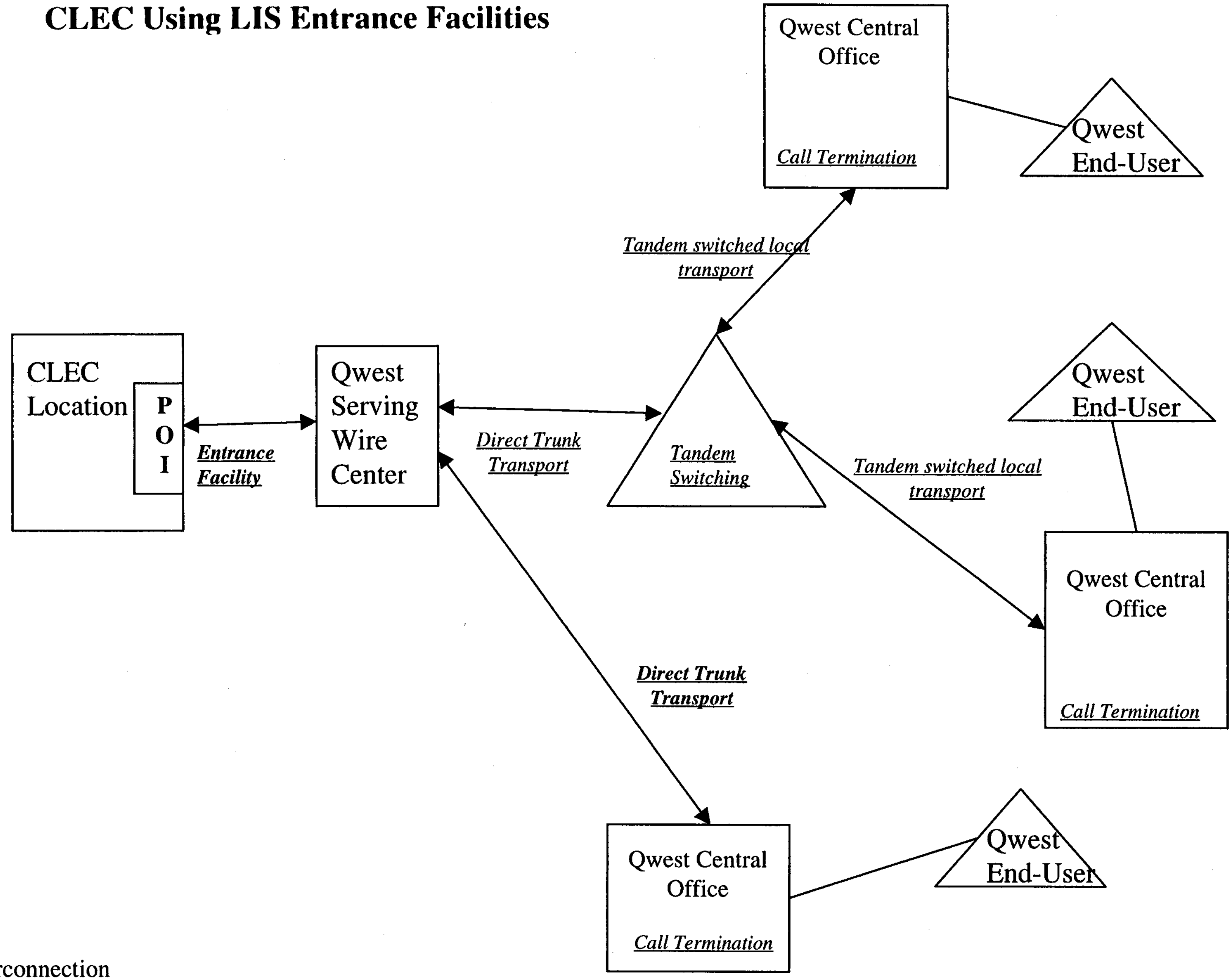
IN THE MATTER OF INVESTIGATION INTO	)	
QWEST CORPORATION'S COMPLIANCE	)	**DOCKET NO. T-00000-00-0194**
WITH CERTAIN WHOLESALE PRICING	)	**PHASE II**
REQUIREMENTS FOR UNBUNDLED	)	
NETWORK ELEMENTS AND RESALE	)	
DISCOUNTS	)	

EXHIBIT OF

ROBERT F. KENNEDY

MARCH 15, 2001

CLEC Using LIS Entrance Facilities



POI = Point of Interconnection

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	)	DOCKET NO. T-00000A-00-0194
	)	AFFIDAVIT OF Robert F. Kennedy
STATE OF Nebraska	)	
COUNTY OF Douglas	)	

Robert F. Kennedy, of lawful age being first duly sworn, depose and states:

1. My name is Robert F. Kennedy. I am Manager – Interconnection Witness. I have caused to be filed written testimony and exhibits in support of Qwest Corporation in Docket No. T-00000A-00-0194.

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

Robert F Kennedy

Robert F. Kennedy

SUBSCRIBED AND SWORN to before me this 9th day of March, 2001, 2001.

Mark C Holling

Notary Public residing at
Omaha, Nebraska

My Commission Expires: ______________

GENERAL NOTARY-State of Nebraska
MARK C. HOLLING
My Comm. Exp. Aug. 15, 2003

BEFORE THE
ARIZONA PUBLIC SERVICE COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	)	DOCKET NO. T-00000A-00-0194 PHASE II

DIRECT TESTIMONY OF

JAMES C. OVERTON

QWEST CORPORATION

MARCH 15, 2001

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EXECUTIVE SUMMARY

My testimony addresses several engineering issues relating to Qwest Corporation's ("Qwest") cost and pricing proposals for unbundled network elements ("UNEs"). Qwest's cost studies and pricing proposals are dependent upon engineering-related assumptions about equipment and activities that are needed to provide UNEs. As a telecommunications engineer with approximately 27 years of experience in the industry, I am addressing these assumptions and demonstrating their reasonableness.

The first section of my testimony discusses the engineering assumptions that Qwest uses in the Loop Module ("LoopMod") of the Integrated Cost Model ("ICM") and demonstrates that, based on real-world experience, these assumptions are reasonable. There are several points relating to these engineering assumptions that should be emphasized:

- The engineering assumptions used in a cost model should be consistent with each other and, in some respects, dependent upon each other. This type of consistency is essential in planning, engineering, and building an actual network, and, therefore, it should be essential to any cost model designed to replicate a network. The LoopMod meets this requirement by using engineering assumptions that are consistent with each other and by relying on assumptions that engineers would use in designing and building a real-life network.

- Qwest has included a user interface with the ICM that allows the user of the model to modify the engineering and other input assumptions. This ability to modify assumptions helps to ensure that the engineering assumptions in the model remain consistent. If the user chooses to modify an input, he or she can modify a related input to maintain the necessary consistency.

- There are several important engineering assumptions in the LoopMod, but assumptions that are of particular importance include: (1) the methods that are used to place cable; (2) the amount of cost sharing that is assumed to take place among utilities in the placement of cables, sometimes referred to as structure sharing; and (3) the fill factors or the assumed levels of utilization for certain equipment and facilities that are in the network. My testimony provides a real-world engineering perspective for each of these assumptions and emphasizes the following points:

• **Cable Placement Activities**

- LoopMod defines placement methods by Density Group
- Example: Density Group 3 (urban single-family residential developments)

Trenching	25%
Directional Boring	45%
Cut and Restore Sod	5%
Cut and Restore Asphalt	10%
Cut and Restore Concrete	5%
Hand Dig Trench	5%
Rocky Trench	5%

- In a situation where the entire network is being replaced and rebuilt in the existing environment with buildings, roads, houses, and yards remaining in place such as that assumed in the LoopMod, cables will have to be placed around, under, or through these existing structures. This reality has a direct effect on the types of placement activities that a cost model should assume. For example, in the real world, engineers often would choose placement methods that are least likely to interfere with existing structures. Customers, governments, and the general public do not like it when roads, yards, sidewalks, and other parts of the environment are torn up to permit cable to be placed. For this reason, in areas that have relatively high population density, it is appropriate to assume the use of placement methods such as directional boring and cut & restore that are less disruptive to the existing environment.

- The placement methods that an engineer chooses also are interrelated. For example, if the amount of directional boring is reduced, then the amount of other placement methods, such as cut and restore, must be increased.

- **Structure Sharing**

- The extent to which a telephone company is able to share the costs of placing cable structures with other companies depends upon the method of placement and the type of area in which the cables are being placed. In the real world, there are very limited opportunities to share the costs of placing buried and underground cable with other utility companies. To the limited extent that sharing is possible for these methods of placement, it is typically available only in undeveloped areas where new construction is taking place. There are more opportunities to share the costs of placing aerial plant, as reflected by the existence of joint use agreements among utility companies. However, the use of aerial plant is on the decline for a variety of reasons relating to maintenance and aesthetics. The LoopMod reflects these realities with the following assumptions relating to cost sharing:

- Buried Cable
  - Sharing the costs of placing buried cable structures will occur, on average, about 20% of the time.
  - Sharing the costs of placing buried cable structures occurs primarily in undeveloped areas.
  - Cost sharing for placing buried cable structures rarely occurs in developed areas.

- Aerial Cable
  - Based on joint use agreements between Qwest and other utility companies, sharing occurs approximately 50% of the time with pole structures.

- Underground Cable - Sharing of conduit structures will occur about 5% of the time.
- It is important to recognize that the ability to share placement costs with other utility companies depends in large part on whether the telephone company is able to time the placement of its cable structures to coincide with the timing of cable placements by other utilities. The telephone company often cannot delay placing facilities until other utility companies are ready to do so, since held orders could result. As the Commission decides on the appropriate assumptions for cost sharing, this important consideration of timing and potential held orders should be kept in mind.

- **Fill Factors**
  - Feeder Networks

    Feeder Networks are planned, engineered, and built based on cable utilization fills. Qwest monitors the feeder fills or utilization levels on its main distribution frames. A 63% utilization of the cable at the main distribution frame represents an efficient design of the outside plant network. Outside plant cable facilities are allocated in twenty-five pair groups to feeder distribution interfaces. The utilization fill of the cable at the main distribution frame represents an 85% utilization at the feeder distribution interface. This is an efficient design of the outside plant network.

- Distribution Networks

  - Distribution networks are not planned, engineered, nor built based on fill factors.
  - Distribution networks are planned for known and forecasted demands.
  - Distribution networks are typically buried.
  - Qwest's standard distribution cable sizing is three (3) pairs per home for Density Groups 3 and 4; two (2) pairs per home/unit for Density Groups 1, 2 and 5.

The second part of my testimony addresses engineering issues relating to line sharing. In this docket, Qwest is asking the Commission to set prices for the two types of architecture that Qwest intends to use in its central offices and that the competitive local exchange carriers ("CLECs") and data local exchange carriers ("DLECs") have requested for line sharing. These different architectures are distinguished primarily by whether the splitter equipment needed for line sharing is located inside or outside the collocation area. I describe the elements that are required to provide line sharing and identify how those elements relate to the costs that Qwest will incur to provide line sharing. I also explain the advantages and disadvantages of each of the two types of architecture that the CLECs/DLECs have requested. Finally, I address two categories of costs that ILECs, such as Qwest, could incur to deploy line sharing and, therefore, may recover from CLECs/DLECs. These categories of costs relate to (1) cross connections (tie cables); and (2) splitters.

I. IDENTIFICATION OF WITNESS

Q. PLEASE STATE YOUR NAME, EMPLOYER AND BUSINESS ADDRESS.

A. My name is James C. Overton. I am employed by the Qwest Corporation, as a Director in the Technical Regulatory Group, Local Network Organization. My business address is 700 W. Mineral Street, Littleton, Colorado 80120.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE, TECHNICAL TRAINING, AND PRESENT RESPONSIBILITIES.

A. I have been employed by Mountain Bell, U S WEST and Qwest for approximately 27 years. The positions I have held that are relevant to the issues in this docket have included the Manager of Outside Plant Engineering for both the states of Arizona and New Mexico in the Capacity Provisioning Engineering Center. During this job assignment, I was responsible for tracking and resolving customer held orders, tracking expense and capital budgets, and hiring engineers for the Capacity Provisioning Center. I was also the manager in the Central Office Detailed Engineering Center. My job responsibilities included managing the Records and Automation Department. As the manager of U S WEST Installation Services, I directed the activities for placing switches, power plants, frames, and transmission equipment in central offices throughout the U S WEST region.

I am presently a Director in the Technical Regulatory Group, Local Network Organization. This responsibilities of this Group include developing strategies to implement the unbundling of Qwest's network as required by the Telecommunications Act of 1996 ("the Act"). I provide technical and regulatory support regarding sub-loop unbundling issues to the Qwest Network and Policy and Law Departments.

II. OVERVIEW OF TESTIMONY

Q. PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY

A. The purpose of the first part of my testimony is to support the engineering input assumptions in the LoopMod of Qwest's ICM, which is described by Dick Buckley. I demonstrate that Qwest's engineering inputs are reasonable and represent forward-looking engineering assumptions.

It is critical that all the assumptions in a cost model are considered as a "whole" and that they be integrated and consistent with each other. The LoopMod engineering assumptions that I discuss are related to one another and are consistent. If a user decides to change an engineering assumption, the other engineering assumptions must be analyzed to determine if they also should be modified to ensure consistency. LoopMod permits this process by easily allowing users to modify inputs and assumptions.

The purpose of the second part of my testimony is to describe the network designs that are appropriate to permit competitive local exchange carriers ("CLECs") and data local exchange carriers ("DLECs") to engage in line sharing. My testimony also describes the types of engineering activities that Qwest must perform in response to requests for line sharing.

Q. WHAT ARE SOME OF THE CRITICAL ENGINEERING INPUTS THAT YOU ADDRESS IN YOUR TESTIMONY RELATING TO THE DESIGN AND INSTALLATION OF FEEDER AND DISTRIBUTION PLANT?

A. The critical cost model inputs and assumptions relating to the design of feeder and distribution plant are: (1) the extent to which the telephone company is able to share the costs of placing cable structure with other utility companies, often referred to as structure sharing; (2) the cable placement methods that are used to construct a replacement network; and (3) the fill factors or utilization levels that are assumed to exist in the network. I address these issues in the testimony that follows.

III. STRUCTURE SHARING

Q. PLEASE DESCRIBE WHAT IS MEANT BY THE TERM "STRUCTURE SHARING."A. Structure sharing refers to the extent to which the telephone company is able to share the costs of placing cable structures with other utility companies. The ability to share these placement costs depends on the method of placement and the type of area in which the cable is being placed. As I discuss below, there are limited opportunities to share the costs of placing buried cable and few opportunities to share the cost of placing underground cable, which is cable that is enclosed in conduit and placed underground. There are more opportunities to share the costs of placing aerial facilities, as Qwest has joint use agreements with other utility companies relating to this type of facility. The LoopMod properly reflects these different degrees of cost sharing opportunities for these different types of cable placements.

Q. WHAT AMOUNT OF COST SHARING DOES LOOPMOD ASSUME FOR THE PLACEMENT OF BURIED CABLE AND WHAT IS THE BASIS FOR THAT ASSUMPTION?

A. Qwest's input into LoopMod relating to cost sharing assumes that the telephone company, on average, will bear 80 percent of the costs of placing buried cable, while other utility companies will bear the other 20 percent. This assumption realistically reflects the fact that the sharing among utility companies of trenches that are used for buried cable occurs primarily in undeveloped areas where new construction is occurring. With new construction, developers often provide a trench for all utilities to use for placing their cable structures. By contrast, in developed, existing areas of the network, sharing rarely occurs because other utility companies usually have their facilities in place already when the telephone company is placing its facilities. Because other facilities usually have their facilities already in place in developed areas, they have no reason to share placement costs with the telephone company. In addition, if it happens that another utility company is placing facilities in a developed area, it is rare that the utility is placing its facilities at the same time that the telephone company is placing its facilities. If it happens that another utility may be placing cables in an area that is already developed, the telephone company usually does not have the luxury of waiting for that utility to place its facilities so that sharing may occur. Waiting to place facilities can lead to held orders, and that is a result that the telephone company must avoid.

Q. WHAT ARE YOUR ACTUAL EXPERIENCES WITH PLACING BURIED CABLES IN SHARED TRENCHES?

A. My actual experience in the field confirms the reasonableness of Qwest's assumption that the telephone company will pay, on average, 80 percent of the costs of placing buried cables. In developed areas, it is very rare that another utility company is placing buried facilities at the same time as the telephone company. As a result, sharing opportunities are rarely available in these areas. The only realistic sharing opportunities for cables placed in trenches occur in undeveloped areas where new construction is occurring. In those situations, it is not unusual for a developer to provide a common trench that utilities use to place their facilities together. In the type of network rebuild that a TELRIC study assumes, most of the facilities will be placed in existing, developed areas, not in areas of new construction. In addition, in a TELRIC study, it is only the telephone network that is being built, not the networks of other utility companies. As a result, other utility companies already have their facilities in place and, therefore, have nothing to place and no costs to share.

Q. WHAT IS "DIRECT BURIED CABLE," AND HOW DOES IT RELATE TO THE PROPER COST SHARING PERCENTAGE FOR BURIED CABLE?

A. Direct buried cable is cable that is directly buried into the ground through the use of a piece of a mechanical piece of equipment. The equipment literally pushes the cable into the ground. This method of placing cable is cost-efficient, since it avoids the costs that are associated with digging and back-filling trenches. This method of placing buried cable is often used in areas where ground and soil conditions permit pushing cable into the ground without digging trenches. When the direct buried method of placement is used, cost sharing typically is not available since only one cable is placed at a time with the equipment that is used. Even without the availability of cost sharing, this method of placement is cost-efficient because of the trenching costs it avoids. A proper cost sharing assumption for buried cable should take into consideration the use of the direct plowing method and the lack of cost sharing opportunities that are available with this method.

Q. WHAT WOULD THE RAMIFICATIONS BE IF THE SHARING ASSUMPTION IN LOOPMOD FOR BURIED CABLE WERE INCREASED?

A. First, I do not believe it would be consistent with real-world experience or with a TELRIC replacement network to assume that the telephone company would pay less than 80 percent of the costs of placing buried cable. But, if it were assumed that the telephone company would pay less than 80 percent of the costs because of increased sharing with other utilities, it must also be recognized that held orders likely would result. This result would occur because the telephone company would have to wait for other utilities to place their buried facilities, and that waiting leads to held orders.

Q. WHAT IS THE PROPER AMOUNT OF COST SHARING FOR AERIAL FACILITIES THAT ARE PLACED ON POLES?

A. Qwest incurs about 50% of the total cost required to support its poles for aerial cables. In other words, it is realistic to assume that Qwest will be able to share about 50% of the costs associated with pole structures used to place aerial cable. This engineering assumption is reflected in the LoopMod cost model.

Q. WHAT IS THE PROPER AMOUNT OF COST SHARING FOR THE PLACEMENT OF UNDERGROUND CABLE IN CONDUIT?

A. The opportunities to share the costs of placing underground cable in conduit are very limited. LoopMod properly reflects that cost sharing for conduit structures occurs no more than 5%percent of the time. This input represents the small amount of conduit that is shared today and is likely to be shared in the future with other telecommunications providers. It is very infrequent that another service provider would want to share the cost of performing duct placement. Normally, Qwest assumes all of the responsibility of engineering, constructing, maintaining and repairing the conduit structure. Qwest cannot share its conduit with power companies. Telephone and power networks are designed differently. A power station is typically located on the outskirts of a city, while a telephone central office is located in the center of the city. Normally, this leaves little, if any, opportunity to utilize each other's conduit. The high voltage of power lines also creates potential safety hazards to Qwest's technicians who are trained to work on low DC Voltage Circuits.

Q. PLEASE SUMMARIZE YOUR TESTIMONY REGARDING THE SHARING ASSUMPTIONS.

A. The Qwest's ICM LoopMod assumes that the telephone company will incur 80% of the cost of placing buried cable, 50% of the cost of pole structures and 95% of the cost of conduit in the network. The cost model inputs are reasonable and reflect the construction methods that Qwest would use to rebuild the outside plant network.

Q. IN CONNECTION WITH COST SHARING, PLEASE DISCUSS THE EXTENT TO WHICH IT SHOULD BE ASSUMED THAT AERIAL CABLES ARE BEING USED.

A. In Arizona, aerial cable accounts for approximately 17% of the total cable footage located throughout the state.

Q. DOES AERIAL PLANT PROVIDE THE SAME QUALITY OF SERVICE AS BURIED AND UNDERGOUND PLANT?

A. No. Aerial plant is prone to service interruptions caused by varying circumstances. Some examples of these circumstances are wind, rain, lighting, squirrels, bullet and pellet damage, and auto accidents. Weather damage is less likely to occur with buried or underground plant because the Qwest cables are not exposed. Good examples of the havoc weather can have on aerial plant are the ice and snowstorms that periodically occur, in locations such as Sedona and Flagstaff. Not only is localized weather damage possible because of severe storms, but entire spans of aerial line may topple during ice storms or blizzards, when accompanied by high winds. In rural areas, mile after mile of aerial lines can fall because of high winds when they are weighted down with ice or snow. Electrical lines damaged by harsh weather could topple bringing down telephone lines that share common poles. In addition, many communities are opposed to the use of aerial plant because of aesthetic concerns.

IV. CABLE PLACING ACTIVITIES

Q. PLEASE DESCRIBE THE CABLE PLACEMENT METHODS REQUIRED IN A TELRIC MODEL?

A. The ICM LoopMod specifically identifies the various construction methods that will be required, by density group, to rebuild a network. For example, the default placement inputs for density group 3 (single family sub-divisions) in LoopMod are: trench and backfill - 25%, cut & restore concrete - 5%; hand dig trench - 5%; directional bore cable - 45%; cut & restore asphalt - 10%; cut & restore sod - 5%. Since construction will be required in areas that are already developed, Qwest would be required to perform cuts in existing landscapes and restore the landscape to its original form. Directional boring methods of construction would also have to be utilized. The use of directional boring avoids the costs that are associated with digging up roads, sidewalks, yards, and similar structures and restoring them to their original form.

Q. WHY IS IT IMPORTANT TO UNDERSTAND THE INTERRELATIONSHIP OF THESE CONSTRUCTION METHODS?

A. It is important that the most appropriate and realistic construction methods are selected. Otherwise, the output from the ICM LoopMod will not represent the true costs of constructing facilities in an existing area. If the inputs are modified and do not accurately represent the construction activity that is required in a given area, the result will generate costs for unbundled loops that do not cover the actual cost to construct these loops. For example, if the cost model user reduces the amount of boring in existing neighborhoods, then some other, more difficult method of construction will be required in order to complete the construction and restore the existing yards to their original condition.

Q. QWEST HAS STATED THAT ITS EXPERIENCE IN BUILDING ITS BROADBAND NETWORK IN OMAHA, NEBRASKA WAS USED IN THE DEVELOPMENT OF CERTAIN ENGINEERING INPUT ASSUMPTIONS. PLEASE EXPLAIN HOW THE OMAHA EXPERIENCE WAS USED.

A. First, it is important to understand that Qwest's input assumptions were influenced from the Omaha experience only in respect to the construction methods, which were required. Qwest has not used any costs incurred in Omaha as a basis for its cost assumptions in its model.

When Qwest built its broadband network in Omaha, the engineering that was done clearly depicted what would occur in a completely rebuilt network. Qwest completely over-built, or replaced, its existing telecommunications network in the areas where the broadband network was deployed. Prior to this, Qwest's experience with replacing an existing network was limited to much smaller geographic areas where rehabilitation of existing facilities was performed.

When Qwest started building its network in existing residential areas, not only did it encounter very difficult placement conditions due to having to place facilities under streets and roadways, but they clearly encountered customer dissatisfaction and many complaints from its use of construction methods which disrupted and destroyed landscaping and customers property such as fences, rock gardens, etc. Qwest quickly learned that construction methods called "cut and restore" (i.e., trenching buried cables and restoring the landscaping and property to its original condition) did not meet the expectations of Omaha residents.

Qwest then changed its construction methods to include the use of directional boring in the placement of its buried cable systems. By using directional boring, it was able to place its cable infrastructure under streets, sidewalks, driveways and customers' landscaping without the disruptions and destruction that it previously encountered. This is the same, as we would do today.

Q. ARE YOU AWARE OF ANY OTHER COMPANIES THAT HAVE SIMILAR EXPERIENCES SUCH AS YOU DESCRIBED WITH QWEST IN OMAHA, NEBRASKA?

A. Yes. Qwest representatives spoke with three TCI employees (now AT&T Broadband) who were involved with rebuilding of its facilities in Bismark, North Dakota. They experienced the need to use construction methods very similar to those used by Qwest in Omaha, Nebraska.

Q. PLEASE DESCRIBE SOME OF THE CONSTRUCTION METHODS USED BY TCI (NOW AT&T BROADBAND) THAT ARE SIMILAR TO WHAT QWEST USES IN ITS COST STUDY.

A. I will summarize several points of that discussion categorized by topic:

Structure Sharing

* The majority of joint trenching opportunities was in new developments.

* The opportunity for sharing of buried trenches is infrequent in rebuild situations because there are few locations where more than one utility has a need to place facilities at the same time.

* The electric company was performing some rebuilds in the area, but were using a front lot feed design which didn't follow TCI cable television design. TCI felt that they would double the required amount of distribution facilities if they used front lot feed design.

* When placing facilities in the same trench as the power company, the power company prefers a buffer space between the two cables of 10 to 12 inches. The power company's cables vary in depth from 24 to 40 inches. TCI's fiber optic cable is placed at a depth of at least 36 inches.

* The TCI rebuild in North Dakota included approximately 220 miles of buried cable. Of that, it is estimated that about 5 miles was shared with the electric company.

Buried Placement Methods

* Boring was used to place about one-half of the 220 miles of buried cable in North Dakota.

* The contractors hired to do the work generally used pneumatic boring when boring was required.

* Most of the remaining 50% of the buried cable placed using small vibratory plows.

* The contractors used plowing where there was access for the equipment.

* The TCI project in North Dakota did not use very much trenching of its buried cable.

V. Summary of Testimony on the ICM LOOPMOD

Q. PLEASE SUMMARIZE YOUR TESTIMONY ON THE ICM LOOPMOD.

A. The ICM LoopMod uses valid and realistic engineering input assumptions. Furthermore, the developers of the ICM LoopMod have made a concerted effort to use engineering input assumptions that are interrelated to build a network that truly works. For example, there are enough feeder facilities in the cost models to support the number of working lines in the distribution areas, or Density Groups, which are built. All of the engineering inputs are consistent and reasonable, and represent the actual methods that would be required to completely rebuild an outside plant network.

VI. LINE SHARING DESCRIPTION AND BACKGROUND

Q. PLEASE BRIEFLY EXPLAIN WHAT LINE SHARING MEANS.

A. Line sharing is the joint and simultaneous use by two different telecommunications carriers of distinct frequency ranges of one loop. In a line sharing arrangement, Qwest provides voice service to the end-user using the voice band frequencies, while the CLEC/DLEC provides data service on the frequency range above the voice band. Through the separation of the voice frequency from the data frequency, one loop can carry both voice and data traffic simultaneously and, potentially, each type of traffic could be carried by a different telecommunications carrier.

At present, however, line sharing only is possible in situations where CLECs/DLECs intend to provide a data service that does not significantly degrade the voice service being provided by ILECs. Given current technology, many types of data services, including SDSL and HDSL, cause unacceptable levels of interference to voice service being carried on shared lines. The FCC recognized this in the Line Sharing Order and determined that only three types of data services, including ADSL, currently are compatible with voice service in a line sharing environment. Line Sharing Order (CC Docket No. 98-147) at ¶ 71.

Q. PLEASE DESCRIBE HOW A TRADITIONAL VOICE CALL IS ROUTED THROUGH THE NETWORK WITHOUT ANY LINE SHARING.

A. A normal voice call comes in to the central office from a home, business, or other outside location on a loop that, depending on the type of frame located in the central office, is connected to a COSMIC[1] frame or Main Distribution Frame ("MDF"). On the frame, the voice call is cross-connected to either the Office Equipment ("OE") side of the COSMIC or MDF, or connected through an Intermediate Distribution Frame ("IDF") to the OE. From there, the voice call is routed to the switch, which is connected to the Public Switched Telephone Network ("PSTN"), thereby allowing the call to route to its intended destination.

Q. PLEASE DESCRIBE HOW A TRADITIONAL VOICE CALL IS ROUTED FOR A CLEC/DLEC THAT HAS COLLOCATED WITHIN A CENTRAL OFFICE.

A. When a CLEC/DLEC is collocated, a voice call comes in to the central office from a home, business, or other outside location on a loop to the COSMIC or MDF, just as in the normal course. However, from the COSMIC or MDF, the call is either cross connected to an IDF and then routed to the CLEC/DLEC's collocation area, or it goes directly from the COSMIC or MDF to the CLEC/DLEC's collocation area. The equipment in the collocation area is then connected to the office equipment of the CLEC/DLEC.

[1] COSMIC is a trademark of LUCENT Technologies

Q. PLEASE DESCRIBE HOW A VOICE AND DATA TRANSMISSION ROUTE THROUGH THE NETWORK IN A LINE SHARING ARRANGEMENT.

A. Line sharing introduces new, unique requirements upon all parties involved in this type of arrangement. New equipment, cross connects, systems, and other complexities are introduced into the network in order to route voice and data traffic separately in a line sharing environment.

Generally, in a line sharing arrangement, the loop comes in to the central office from a home, business, or some other outside location and connects to the COSMIC or MDF. From there, however, things begin to change. The loop then is cross-connected and routed to an IDF, which, in turn, is cross connected and then routed to a "POTS splitter." The POTS splitter literally splits the voice and data traffic into two distinct transmissions, thereby allowing the voice and data traffic to be routed to Qwest and the data traffic to the CLEC/DLEC. The data traffic is then routed to the CLEC/DLEC collocation area. The voice traffic is routed back through the IDF, to the OE side of the COSMIC or MDF, and then to the Qwest switch

Q. PLEASE DESCRIBE THE PRIMARY PIECE OF EQUIPMENT THAT "SPLITS" THE VOICE AND DATA TRAFFIC.

A. As described above, this device is referred to as a POTS splitter; it resides at both the central office and end-user location. The POTS splitter allows the copper loop to be used for simultaneous voice and data transmission by different telecommunications carriers. POTS splitters usually come in two configurations: (1) a single splitter version designed for mounting at the end-user premise; and (2) a multiple splitter version designed for mass termination at the central office. A POTS splitter is a passive device, meaning it does not require power. POTS splitters have bays, each of which can contain eight shelves or panels. Each shelf typically can accommodate 96 shared lines; however, this will vary depending on the manufacturer of the POTS splitter. As stated, POTS splitters do not require external power to work, yet they still support lifeline services, such as 911, in the event of a power loss.

VII. NETWORK ARCHITECTURE

Q. WHAT IS THE PRINCIPAL DECISION REGARDING NETWORK ARCHITECTURE THAT MUST BE MADE TO IMPLEMENT LINE SHARING?

A. The principal decision regarding line sharing network architecture is where to place the POTS splitter within the central office. There generally are three options: (1) placement of the splitter in a common area, (2) placement of the splitter on an IDF; (3) placement of the splitter on an MDF. In addition to these options the CLEC/DLEC can choose placement of the POTS splitter in the CLEC/DLEC's collocation area. Each alternative has unique costs, requirements, and benefits.

Q. DESCRIBE THE NETWORK ARCHITECTURE AND EQUIPMENT NEEDED TO PLACE THE POTS SPLITTER IN A COMMON AREA OF THE CENTRAL OFFICE.

A. When the POTS splitter is placed in a common area of the central office, the shared loop comes in to the central office from an end-user premise and connects to the COSMIC or MDF. The shared loop then is cross connected to an IDF which is, in turn, cross connected to a POTS splitter located in a common area. At the POTS splitter, the voice traffic is split from the data traffic, and the data traffic is routed back to an IDF where it is cross connected to a DSLAM, which provides high speed data transmission and is located in the collocation area of the CLEC/DLEC. From there, the data traffic is routed to its intended destination over the CLEC/DLEC's network. The voice traffic also is routed from the POTS splitter back to an IDF, but, from there, it is cross-connected back to the COSMIC or MDF. At the COSMIC or MDF, the voice traffic is cross-connected to a switch for routing to its intended destination over the PSTN.

In this configuration, up to six cables, therefore, must be placed in the central office: (1) the first between the COSMIC or MDF and the IDF for both voice and data traffic (called Interconnection Tie Pairs-ITPs); (2) the second between the IDF and the POTS splitter for both voice and data traffic (included in the cost of the splitter options); (3) the third between the POTS splitter and the IDF (or collocation area) for data traffic; (4) depending on the option chosen, possibly the fourth between the IDF and the collocation area of the CLEC/DLEC for data traffic (a termination); (5) the fifth between the POTS splitter and the IDF for voice traffic (included in the cost of the splitter options): and (6) the sixth between the IDF and the COSMIC or MDF for voice traffic(an ITP). Four cross-connects, three additional termination blocks also are required, and space is required for placement of the POTS splitter. Most of the necessary cabling would need to be purchased and installed as well as the POTS splitters. All of these facilities will require significant effort and cost to install. Graphical depictions of the various options can be found in the Exhibits to the testimony of Ms. Teresa Million.

Using the architecture where the POTS splitter is placed in a common area, the CLEC/DLEC can purchase the POTS splitter or ask QWEST to purchase it subject to reimbursement. In either case, QWEST is responsible for installing the POTS splitter in the common area. Qwest also has responsibility for maintenance and repair of the POTS splitter. The CLEC/DLEC must make special arrangements for test access to the POTS splitter.

Q. DESCRIBE THE NETWORK ARCHITECTURE AND EQUIPMENT NEEDED TO PLACE THE POTS SPLITTER IN THE COLLOCATION AREA OF THE CLEC/DLEC.

A. Placement of the POTS splitter in the collocation area of the CLEC/DLEC is much less complicated as compared with placing the splitter in a common area of the central office, because it requires placing significantly less equipment in the central office and, hence, involves substantially less installation time. For this reason, this architecture results in shorter implementation time frames and significantly less cost.

When the POTS splitter is placed in the collocation area of the CLEC/DLEC, the shared loop comes in to the central office from an end-user premise and connects to the COSMIC or MDF. The loop is then cross connected and routed to an IDF which, in turn, is cross connected and routed to a POTS splitter located in the CLEC/DLEC's collocation area. At the POTS splitter, the voice traffic is split from the data traffic, and the data traffic is routed through a DSLAM to its intended destination over the CLEC/DLEC's network. The voice traffic, on the other hand, is routed back to the COSMIC or MDF via an IDF. From the COSMIC or MDF, the voice traffic is cross-connected to a switch for routing to its intended destination over the PSTN.

This architecture, therefore, requires placement of only four cables: (1) the first between the COSMIC or MDF and the ICDF (an ITP); (2) the second from the ICDF to the POTS splitter for both voice and data traffic (a termination); (3) the third between the POTS splitter and the ICDF(termination); and (4) the fourth to the COSMIC or MDF for voice traffic (an ITP). Four cross -connects and termination blocks also are required. Much of the cabling, however, already is in place in many central offices and will not require additional effort or cost to install. This is because ITPs and Terminations are commonly used unbundled network elements of any type of collocation.

Using the architecture in which the POTS splitter is located in the CLEC/DLEC's collocation area, the CLEC/DELC purchases and installs the POTS splitter within the collocation area, and it has responsibility for maintenance and repair of the splitter. With this architecture, therefore, the CLEC/DLEC has the ability to install its own test access devices and has complete control over acquisition and installation of the POTS splitters. This architecture affords the CLEC/DLEC the ability to control its relationship with its end-users, reducing reliance on Qwest. The use of this architecture should increase the speed to market of the CLEC/DLEC, thereby facilitating greater competition, and it could improve the end-user experience.

VIII. CROSS CONNECTS

Q. DOES THE FCC RECOGNIZE THAT QWEST CAN RECOVER COSTS ASSOCIATED WITH INSTALLING CROSS-CONNECTS?

A. Yes. In the Line Sharing Order, the FCC stated at paragraph 145:

> "We would expect that the costs of installing cross connects for XDSL services in general would be the same as for cross connecting loops to the competitive LECs' collocated facilities, particularly where the splitter is located within the incumbent LEC's MDF. Accordingly, we find it reasonable to establish a presumption that, where the splitter is located within the incumbent LECs' MDF, the cost for a cross connect for entire loops and for the high frequency portion of loops should be the same. We would expect the states to examine carefully any assessment of costs for cross connections for xDSL services that are in excess of the costs of connecting loops to a competitive

> LECs' collocated facilities where the splitter is located within the MDF.

In making this statement, the FCC assumed that the splitter would be located "within" the ILECs' MDF or, presumably, the COSMIC. In most instances, the CLEC/DLEC has chosen a bay mounted type of splitter that will be located in close proximity to the IDF. Thus, the alternative suggested by the FCC in the Line Sharing Order is implicated. With respect to this alternative, the FCC stated at paragraph 145 that:

> "If the splitter is not located within the incumbent LEC's MDF, however, then we would expect the states to allow the incumbent LEC to adjust the charge for cross connecting the competitive LEC's xDSL equipment to the incumbent LECs' facilities to reflect any cost differences arising from the different location of the splitter, compared to the MDF. We would expect that this amount would be only minimally higher than for cross connecting a splitter located within the MDF to the competitive LEC's xDSL equipment."

This is exactly what Qwest seeks to do here.

Q PLEASE DESCRIBE THE PLACEMENT AND NUMBER OF CROSS-CONNECTS NECESSARY TO IMPLEMENT EACH NETWORK ARCHITECTURE (POTS SPLITTER IN COMMON AREA OR COLLOCATION SPACE) DESCRIBED ABOVE.

A. As described above, when the POTS splitter is placed in a common area, a total of four cross -connects, as many as six cables and three termination blocks, are required to implement line sharing. By contrast, when the POTS splitter is placed in the collocation area of the CLEC/DLEC, four- cross connects, as well as four cables and two termination blocks, are required. The cost of cross connects and related equipment, therefore, is significantly less when the POTS splitter is placed in the collocation area of the CLEC/DLEC.

IX. SPLITTERS

Q. PLEASE LIST THE TERMS AND CONDITIONS THAT QWEST AND THE CLEC/DLECs HAVE AGREED UPON FOR POTS SPLITTER COLLOCATION.

A. Qwest and the CLEC/DLECs spent a substantial amount of time prior to execution of the Line Sharing Stipulation discussing how to best implement line sharing. The following summary constitutes the agreement that was reached in the agreement vis-à-vis placement of the POTS splitter:

1. The CLEC/DLEC has the option to purchase the POTS splitter of its choice or to have Qwest purchase the splitter on its behalf. If Qwest purchases the POTS splitter on behalf of the CLEC/DLEC, the CLEC/DLEC must reimburse Qwest for the cost of the POTS splitter.
2. Regardless whether Qwest or the CLEC/DLEC purchases the POTS splitter, the POTS splitter selected will meet one of the following criteria:
    a. the POTS splitter must have been tested during Lab and Field Tests;

b. The POTS splitter must meet the requirements for central office equipment collocation set by the FCC in its March 31, 1999 order in CC Docket No. 98-147.

3. A minimum of one shelf order increment per CLEC is required based on splitter specifications. A bay will house up to eight shelves of splitters. By ordering a shelf at a time, a bay will accommodate more than one CLEC.

4. Qwest will install and maintain the POTS splitters.

5. The CLEC/DLEC will provide the POTS splitter to Qwest at no cost.

6. Qwest will engineer and install the POTS splitter in close proximity to an IDF to allow for shorter cables between the IDF and POTS splitter.

7. The CLEC/DLEC has the option of purchasing the requisite cabling for itself, provided the cable is given to Qwest for installation, or it may ask Qwest to purchase the cabling.

8. Cables on the Qwest side of the IDF will be Shielded Category 3 cables to reduce the possibility of spectrum interference.

9. Qwest will provide the CLEC/DLEC with Carrier Facility Assignment ("CFA") 15 days prior to the Ready For Service ("RFS") date of the POTS splitter.

10. Qwest may co-mingle several CLEC/DLEC POTS splitters in a single bay in order to maximize space availability.

11. The CLEC/DLEC may choose to utilize existing cables that run from its collocation area to the IDF (i.e., terminations) to support line sharing

arrangements. This will reduce the time and cost to implement line sharing.

12. Qwest must engineer and install cable from: (1) the POTS splitter to the COSMIC or MDF for voice traffic; (2) the COSMIC or MDF to the POTS splitter for both voice and data traffic; and (3) the POTS splitter to the IDF for data traffic. To expedite line sharing provisioning, Qwest has agreed to administer all cross -connects.

13. The CLEC/DLEC will provide Qwest with cross connect information, CFA, on its side of the IDF to enable Qwest to perform the cross connects.

14. The test point access for the CLEC/DLEC will be at the DMARC point on the POTS splitter. The DMARC is the data cable from the POTS splitter back to the IDF.

Q. IF THE POTS SPLITTER IS TO BE PLACED IN A COMMON AREA OF THE CENTRAL OFFICE HOW DOES A CLEC/DLEC REQUEST POTS SPLITTER PLACEMENT?

A. To initiate POTS splitter placement, the CLEC/DLEC must submit an application form to Qwest requesting line sharing. The CLEC/DLEC must provide the following standard information to Qwest on the application form:

1. The identity of the party that will provide the requisite cable and POTS splitter(s).

2. The manufacturer name and serial number for the POTS splitter(s).
3. The number of POTS splitters to be placed in the central office.
4. The CLEC/DLEC's forecasted line sharing requirements.
5. The CLEC/DLEC's shelf requirements for the POTS splitter(s).
6. The CLEC/DLEC's cable requirements, whether they are new or existing cables, to support the POTS splitter placement. If the CLEC/DLEC intends to reuse cables, the CLEC/DLEC must identify the intended cable pairs and their CFA assignments, as well as whether it wants the cable to be shielded.
7. Any special cable requirements.

If placement of the splitter collocation is feasible in the subject central office, Qwest prepares a quote showing the charge for the placement. Before Qwest will begin installation of the POTS splitter, the CLEC/DLEC must pay 100 percent of the quote in advance.

Obviously, the CLEC/DLEC will not need to submit an application for POTS splitter collocation in central offices where the POTS splitter will be placed in its collocation area. If the CLEC/DLEC needs additional collocation space to accommodate placement of a POTS splitter, it will have to submit a standard collocation request.

X. THE WORK NEEDED TO COMPLETE SPLITTER COLLOCATION

Q. PLEASE DESCRIBE THE PRELIMINARY ENGINEERING THAT QWEST MUST PERFORM FOR SPLITTER COLLOCATION, AND STATE THE AMOUNT OF TIME THAT IS REQUIRED TO COMPLETE THIS WORK.

A. When Qwest receives a request for splitter collocation, it must begin the job by having an in-house "detail engineer" retrieve from a database detailed drawings of the central office where the collocation has been requested. These drawings identify where equipment is located in the central office, including; for example, cable racking that may be used for splitter collocation. The drawings also indicate the type of equipment that is in a central office. For example, the drawings show the type of bay equipment in a central office. The detail engineer looks at the type of bay equipment to determine if extenders may be needed to carry out the splitter collocation. After retrieving the drawings, the detail engineer determines whether there are any ongoing construction or engineering jobs at the central office that should be included in the drawings. If there are jobs that are in progress, the detail engineer marks up the drawings to reflect these jobs and their location within the central office. It is essential to reflect any ongoing jobs in the central office, as those jobs may affect the configuration of the splitter collocation.

My discussions with the detail engineers who have worked on the splitter collocations within Qwest's territory establish that the preliminary engineering process requires, on average, about two hours to complete. Based on my experience, this is an appropriate amount of time to complete this step.

Q. PLEASE DESCRIBE THE WALK-THROUGH OR FIELD SURVEY THAT AN ENGINEER MUST CONDUCT FOR SPLITTER COLLOCATION.

A. After making any necessary changes to the drawings, the detail engineer provides them to a field engineer who must then conduct a walk-through or field survey at the central office. The field survey serves two important purposes. First, the survey is necessary to permit a comparison of the drawings to the actual configuration of the central office. Because of the rapid pace of growth and changes in Qwest's central offices, Qwest engineers must conduct this type of comparison every time a CLEC submits a collocation request.

Second, a field survey is needed to ensure that the space designated for the splitter collocation is adequate. This evaluation requires several steps on the part of the field engineer. For example, the field engineer must conduct a load assessment to ensure that the weight-bearing capacities of the floor and ceiling where the collocation is occurring meet the requirements of OSHA and NEBS. This evaluation requires the engineer to coordinate with other Qwest employees in the real estate group who have information about the weight-bearing capacity of the property. The engineer also must take detailed cable measurements, identify the routing paths for the cables that will be used in the collocation, and determine whether any additional cable racking will be needed for the job.

My discussions with the field engineers who have performed the actual field surveys for splitter collocation establish that this process requires, on average, about five hours to complete. This total does not include the travel time that generally is an unavoidable part of the field survey process.

Q. AFTER COMPLETING THE PRELIMINARY ENGINEERING FOR SPLITTER COLLOCATION, MUST QWEST ENGINEERS PERFORM THE ACTUAL ENGINEERING FOR THE JOB?

A. Yes. Preliminary engineering refers to the planning that is necessary for every collocation job. The engineering phase involves the preparation of the detailed work prints and project management of the construction job. These phases are separate from each other, and each phase is necessary for every request for splitter collocation that Qwest receives from a CLEC.

Q. PLEASE DESCRIBE THE ENGINEERING THAT QWEST MUST PERFORM FOR SPLITTER COLLOCATION, AND STATE THE

AMOUNT OF TIME THAT IS REQUIRED TO COMPLETE THIS WORK.

A. Upon completing the field survey, the field engineer returns the drawings of the central office to the detail engineer. The detail engineer adds any markings to the drawings that are needed as a result of the field survey and then enters the new drawings into the database. In many cases, because of this new job, the drawings must be changed to reflect the locations of the cable placement, bays, cable racking, frames, floor bracing, and ceiling bracing. The detail engineer then orders the equipment needed for the splitter collocation job based on the drawings that are in the database. After ordering the equipment, the detail engineer is responsible for tracking the shipping and delivery of the equipment.

As part of the engineering of splitter collocation, a detail engineer must complete database forms to lay out the circuit count and configurations for the customer. The configurations specific to each customer are built into the switch database to facilitate order processing.

After inputting the information into the switch, the detail engineer must complete the engineering of the job. This part of the process requires the engineer; first, to confirm receipt of the equipment and materials needed to complete the splitter collocation. The engineer must then "engineer" each circuit, which requires making virtual connections for each circuit through the database. If a customer orders 200 DSOs, for example, the detail engineer must establish 200 virtual connections in the database.

The engineering phase of splitter collocation requires, on average, about eight hours to complete as established by the detail engineers, in various work groups, who have performed the actual splitter collocations in our central offices.

Q. WHAT IS THE FINAL PHASE OF WORK THAT QWEST MUST PERFORM FOR SPLITTER COLLOCATION?

A. The final phase involves verifying that the job has been engineered properly and completing the paper work associated with the job. As part of this process, the detail engineer must verify that all circuits have been properly assigned and that the cable and hardware have been properly placed. The engineer also must verify that the circuits have been transferred from the TIRKS Database and established in the SWITCH Database. The detail engineer also must fill out Excel spreadsheets that set forth the location of the splitter and the cable counts. These forms are provided to the CLECs and are essential to allow the CLECs to place their orders for line sharing.

The experience of the detail engineers who have carried out the splitter collocations have established that this final phase of the process requires, on average, approximately seven hours to complete.

Q. BASED ON THE DESCRIPTIONS OF WORK YOU HAVE PROVIDED, HOW MANY HOURS ARE YOU RECOMMENDING BE INCLUDED IN A COST STUDY FOR SPLITTER COLLOCATION?

A. As my description of splitter collocation demonstrates, the average amount of time required to complete this type of collocation is approximately 22 hours; two hours for preliminary engineering; five hours for a field survey; eight hours for engineering; and seven hours for job verification and completion of job forms and paper work. Accordingly, I have recommended that the cost study use 20 hours as a reasonable, conservative estimate of the amount of time that Qwest must invest to complete a splitter collocation.

Q. CAN YOU PLEASE OUTLINE THE STEPS NECESSARY TO INSTALL A SPLITTER SHELF INTO AN EXISTING RELAY RACK?

A. Yes. The actual installation of a splitter shelf requires numerous activities. First, the installation department must inventory all of the equipment that is required for the splitter installation. Second, all of the auxiliary framing and associated framework and relay racks must be placed. This activity requires the framework to be drilled, mounted and secured to the overhead structure and the floor. Third, an installer must unpack the splitter shelf and mount it into the relay rack. The splitter shelf is secured in the relay rack by mounting screws. Fourth, an installer must install the appropriate number of connecting blocks on the MDF or the

COSMIC frame. Fifth, an installer must run cable from the connecting blocks vertically, up to the ladder rack and then the cable is routed through the central office to the relay rack that houses the splitter shelf. The cable has to be secured to the relay rack and at all locations where the cable is loose and could be torn away from the connections. Sixth, an installer must terminate the cable at the connecting blocks. Before the cable can be terminated, each individual wire has to be stripped of insulation and spread apart from the binder groups. Next, the individual wires have to be wrapped down on the block one at a time. Seventh, the cable must be connected to the splitter shelf. Eighth, it is necessary to conduct a continuity test to ensure that there is a continuous connection between the splitter shelf and the connecting block. Ninth, the connecting blocks, splitter shelves and relay racks are stenciled. Finally, an installer must mark all drawings to reflect the changes in the central office, update existing records, and provide the updated records to the appropriate parties.

XI. USE OF COSMIC FRAMES

Q. IS IT A CORRECT ASSUMPTION THAT ONLY MDFs WILL BE UTILIZED AND COSMIC FRAMES WILL NOT BE USED?

A. No, real-world central offices include both MDFs and COSMIC frames. Qwest has been using MDFs in its central offices for decades and has been using COSMIC frames for the past 25 years. COSMIC frames, however similar to the

MDF's, utilize the short jumper concept to provide a cross connect point in a digital environment. Because they are smaller than MDFs, COSMIC frames allow Qwest to save space and, in turn money in its central offices. These frames allow for single-sided jumper operations as contrasted with MDFs that utilize the traditional double-sided arrangement. The space that Qwest saves through the use of COSMIC frames reduces, for example, the building costs that Qwest incurs. Without these frames, Qwest's overall operational costs would be higher.

Q. WILL THE USE OF AN INTERMEDIATE FRAME BE REQUIRED?

A. Yes, CLEC/DLEC testimony in some jurisdictions has asserted that a 100 pair tie cable will be placed from the splitter location to the MDF or COSMIC frame for voice and then another cable for voice and data, and also, a 100 pair tie cable from the splitter to the collocation area to carry data. But what is omitted from this assertion is that, in a 96-line splitter, there are 12, 25 pair cables that must be connected into the back of the splitter. In this arrangement, there are 4 cables that carry data, and 4 cables that carry voice, and then 4 cables that carry voice and data. These 12 cables must "physically" connect to the 3, 100 pair tie cables that connect to the collocation area and the MDF or COSMIC frame. Therefore, either an IDF is "physically" needed to make the transition from the cables that plug into the splitter to the tie cables.

XII. THE AMOUNT OF LADDER RACK REQUIRED FOR SPLITTER COLLOCATION

Q. HOW MUCH LADDER RACK IS REQUIRED TO PROVIDE SPLITTER COLLOCATION?

A. Ladder rack is used in Qwest's central offices to place and secure the cables that are routed from the relay racks. The ladder rack is located above the relay racks, which houses different types of equipment. Qwest has conducted a sample survey in which line sharing has been installed. This survey establishes that the average length from the main frame to the splitter location is 104 feet. Based on the results of this survey, I have recommended that we assume an average length of 100 feet. This assumption, based on actual lengths in the central offices studied, accurately represents the costs Qwest will incur. (Refer to Exhibit 1)

XIII. CONFIURATION OF RELAY RACKS

Q. HOW SHOULD A RELAY RACK BE CONFIGURED TO HOLD SPLITTER SHELVES?

A. While a relay rack can hold up to 14 splitter shelves, Qwest recommends a 60 percent fill rate for each relay rack, which is eight splitter shelves per relay rack. Again, this figure is a conservative assumption supported by what is actually occurring in Qwest's central offices today. In Qwest's offices surveyed, where splitters have been installed, demonstrates that there is currently an average of only three splitter shelves per relay rack. In addition, there is substantial evidence indicating that line sharing will be short-lived technology, and that, therefore, there will never be high utilization of relay racks. For example, there has been much recent discussion in the industry about the emergence of Voice Over IP as a broad-based technology. In my view, technologies of this type limit the foreseeable life of line sharing.

XIV. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes

BEFORE THE
ARIZONA PUBLIC SERVICE COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	)	DOCKET NO. T-00000A-00-0194 PHASE II

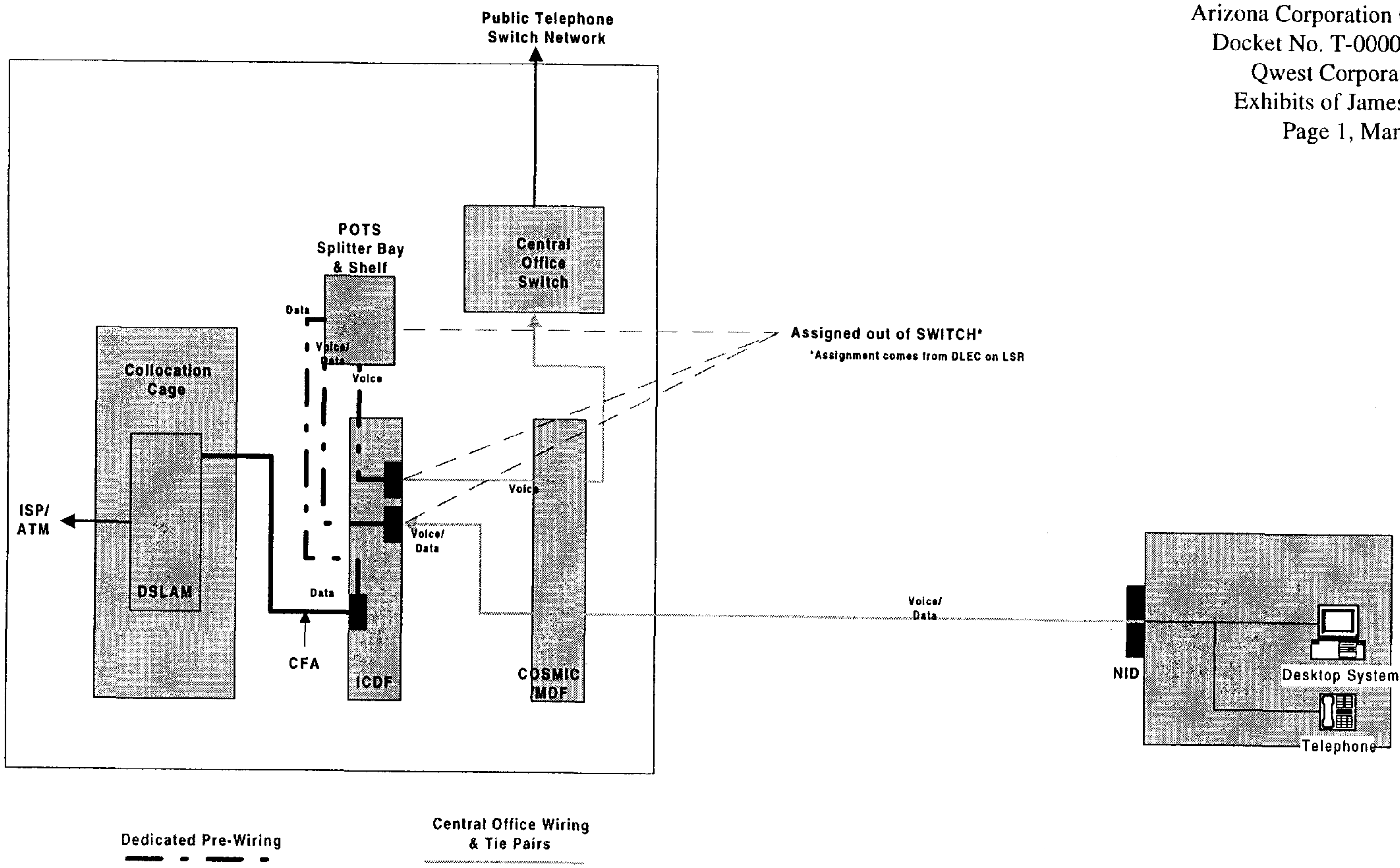
EXHIBITS OF

JAMES C. OVERTON

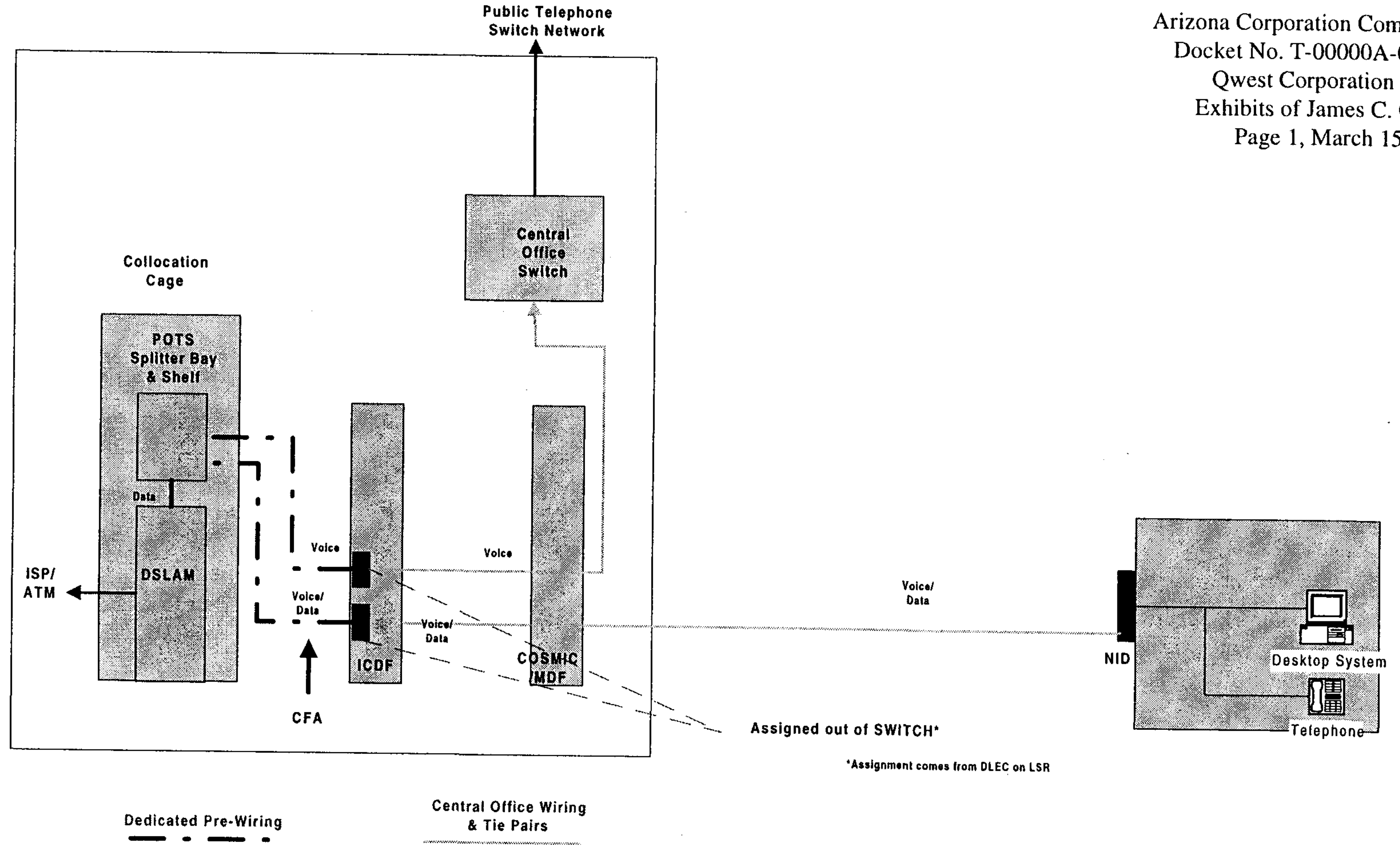
QWEST CORPORATION

MARCH 15, 2001

INDEX OF EXHIBITS



Shared Loop (DLEC-Owned POTS Splitter resides outside Cage)



Shared Loop (POTS Splitter resides inside Cage)

BVAPP - (BVMV...)	Average Units	71049	71050	71051	71342	71343	71341	71323	71340	71339	71344	71345	71322	71899	71908
Cabling Type 1 Footage	107.90	150	100	75	80	100	180	80	100	180	100	75	100	120	120

BVAPP - (BVMV...)	71900	71856	71886	71903	71847	71895	71893	71815	71896	71805	71852	71911	71897	71908	71817
Cabling Type 1 Footage	180	120	85	20	120	120	220	120	50	100	100	65	65	100	220

BVAPP - (BVMV...)	71830	71910
Cabling Type 1 Footage	50	50

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BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER

IN THE MATTER OF INVESTIGATION INTO QWEST CORPORATION'S COMPLIANCE WITH CERTAIN WHOLESALE PRICING REQUIREMENTS FOR UNBUNDLED NETWORK ELEMENTS AND RESALE DISCOUNTS	)	**DOCKET NO. T-00000A-00-0194** **AFFIDAVIT OF** JAMES C. OVERTON
STATE OF COLORADO	)	
COUNTY OF ARAPAHOE	)	

James C. Overton, of lawful age being first duly sworn, deposes and states:

1. My name is James C Overton, Director in the Technical Regulatory Group, Local Network Organization in Littleton Colorado. I have caused to be filed written testimony and exhibits in support of Qwest Corporation in Docket No. T-00000A-00-0194.

2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and correct to the best of my knowledge and belief.

Further affiant sayeth not.

James C. Overton

SUBSCRIBED AND SWORN to before me this 16th day of MARCH, 2001.

Ann Marie Robbio
Notary Public residing at
Littleton, Colorado

My Commission Expires: AUGUST 6, 2004

ANN MARIE ROBBIO
MY COMMISSION EXPIRES
AUG
06
2004
STATE OF COLORADO
NOTARY PUBLIC